Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOL. XIII. NEW YORK, JULY 31, 1858. NO. 47.

THE
SCIENTIFIC AMERICAN,
PUBLISHED WEEKLY
At No. 128 Fulton street, (Sun Buildings,) New York,
BY MUNN & CO.

O. D. MUNN, S. H. WALES, A. E. BEACH.

Responsible Agents may also be found in all the principal cities and towns in the United States.

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Improved Magnetic Steam Gage.

This invention consists in combining tight chambered mercury gages for indicating steam pressure or vacuum, with self-adjusting or floating magnets, magnetic needles and index dials, in such a manner as to give true magnetic indications of varying degrees of pressure occurring within steam boilers, or of vacuum in condensers, the mercury, floating magnet, and body of air through which this result is accomplished being enclosed in a chamber, without the necessity of employing any communicating means with the exterior dial plate likely to affect the accuracy of their movements, the whole being of such a character as to be adapted to the knowledge of the engineer, and completely under his control, and susceptible of being tested at any time, and adjusted if incorrect while in position for work.

In our engraving, Fig. 1 represents a front elevation of the improved magnetic pressure gage, with the needle indicating thirty pounds pressure. Fig. 2 is a front view of the gage, with the dial plate removed, to expose the contents of the same; and Fig. 3 is a vertical section of the same. Similar letters in the figures refer to corresponding parts.

The magnet, D, having a north and south pole, may be about four inches in length, and is provided with pivots, A, at the center, upon which it is hung within a small pressure or vacuum gage chamber, C, formed by a brass index or dial plate, B, and a dish-shaped iron casting. The length of the magnet should not be increased, for the reason that when the magnet and needle are placed at right angles their points are so remote that certain action cannot be relied upon. The exact form of the magnet is not material, except that one arm is required to be larger than the other, so as to ensure its floating in relation to the surface of the mercury represented, and rising and falling with it. The magnetic needle is made and suspended outside the dial plate in the ordinary way, and corresponds in length with the magnet, D. E is a stop, for preventing the poles of the magnet from changing sides in the chamber, and thus insuring the true position of the magnet and index point of the needle. F is a bent tube, which acts as a receiving chamber (in place of which a secondary chamber may be constructed within the body of the instrument) for the mercury, while charging the gage with the same, previous to the application of pressure, and from which tube or chamber the mercury is forced by the pressure of the steam into the chamber of the gage in the exact ratio of the pressure applied. At the top of the chamber, C, is an opening, G, for the purpose of charging it with mercury to adjust the point of the needle to the scale on the index. To determine this, mercury should be poured in until the point of the needle points to zero, or to the 0 on the index, when the opening is closed by a plug, or other means, and the instrument is in working order. The index on the dial plate is correctly graduated under a column of mercury. The index for vacuum may be made on the opposite side of the same dial plate, and the same instrument may be used either as a pressure or vacuum gage by changing the connections from a boiler to a condenser, or from a condenser to a boiler, and charging the gage, as before stated, for a pressure gage, or by filling the entire chamber with mercury before closing the opening, G, for a vacuum gage. The pipe, F, is provided with a cock, H, for passing off any superabundant mercury that may be contained in the chamber, C, to admit of the ready adjustment of the instrument.

LOWE & BARNUM'S MAGNETIC STEAM GAGE.

Fig. 1

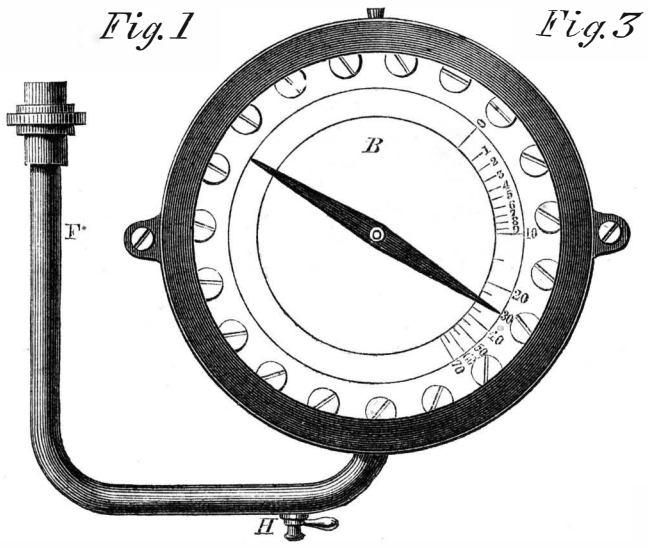


Fig. 3

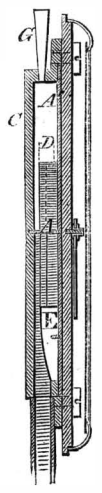
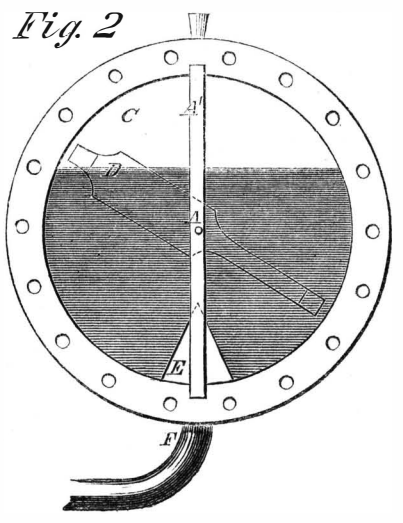


Fig. 2



From the foregoing description it will be observed that the working parts of this simple and effective steam gage are not encumbered by any stuffing box or other device likely to create friction, and in any manner retard their action, and that the magnetic attraction between the magnet, D, and needle through the brass dial plate will at all times keep the two parallel, and that moreover the engineer can at all times properly adjust the needle to the dial plate by simply shutting off the pressure of the steam from the boiler by closing a cock, removing the plug from the opening, G, and after setting the instrument again inserting the plug and closing the cock. This important feature places the instrument under the sole control of the engineer, and enables him to test its accuracy at all times —a desideratum not possessed by the ordinary steam gages in use.

It was patented by Joshua Lowe and Daniel Barnum, on the 8th of July, 1858. Any further information can be had by addressing Daniel Barnum, No. 2 Sussex Place, Jersey City, N. J.

GLEASON'S CAR COUPLING.

Fig. 1

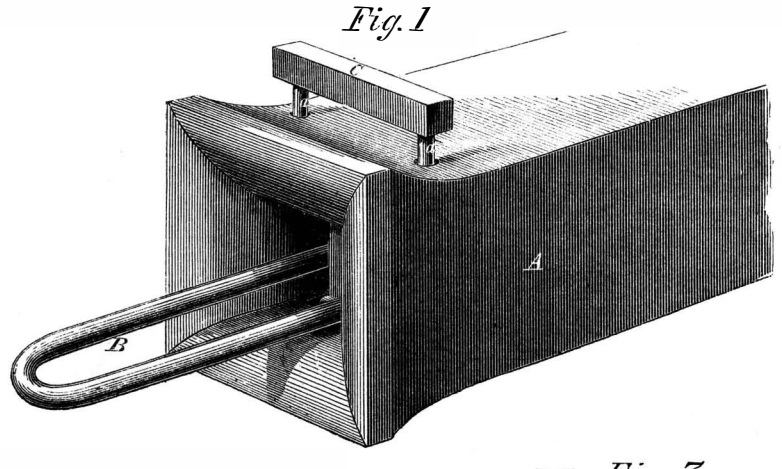


Fig. 2

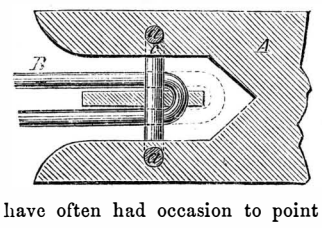
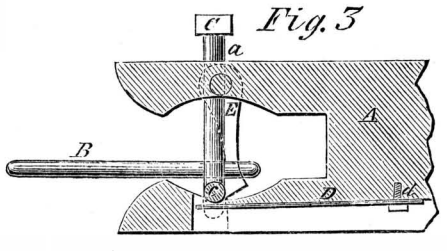


Fig. 3



We have often had occasion to point out the advantages which would be obtained by the use of some improved coupling that would prevent the necessity of persons passing between the cars when liable to move, to couple them, and that would allow of the cars being easily detached from the platform, in case of accident. We now reiterate the enumeration of these desirable ends, and proceed to describe the coupling which is the subject of our engravings.

Fig. 1 is a perspective view of the coupling box, A, having its mouth flared as usual, and in which the link, B, is secured. C is a cross bar that projects slightly above the platform, and is supported by two bars, *a*, which are connected at the bottom by a cross bar, *c*. This is seen in Fig. 2, which is a horizontal section of the coupling box, and also in the vertical section, Fig. 3. The cross bar, *c*, is kept above the level of the bottom of the box by the spring, D, attached to the box at *d*. There is a proper recess in the box to admit of this bar, *c*, being pressed below the plane of the bottom of the box, by pressure on the cross bar, C. E is a loose tongue, hinged to the upper side of the coupling box, and hanging with its lower end in contact with and behind the cross bar, *c*, when it is in an elevated state.

The operation is as follows :—When the coupling is in its normal state with the bars, *c* and C, in the position shown in Fig. 3, the link can be pushed in, and as it enters it lifts E, passes under it, and E drops into the link, forming a perfect lock, as the bar, *c*, prevents it from coming forward, this car can now be run against another, and the projecting portion of the link instantly couples itself in the other car. When it is desirable to uncouple the cars, all that is required is that the bar, C, be pressed with the foot, and consequently *c* is pushed into the recess, allowing E to swing forward, and the link instantly disengages itself from the car.

The inventor is F. E. Gleason, of Columbus, Ohio, and additional particulars can be obtained by addressing him or Mr. John Short, of the same place. It was patented May 18th, 1858.

A New Application of Science.

A photographer in London—Mr. H. Watkins—advertises to get up visiting cards with the caller's portrait on one corner. We shall probably soon be receiving letters with the writer's face indelibly portrayed at the top of the sheet.

MACHINE FOR PEGGING BOOTS AND SHOES.—S. D. Tripp, of Stonehaven, Mass., objects to our note, headed as above, on page 345 of the present volume of the SCIENTIFIC AMERICAN, and says that he has a machine that will peg boots and shoes perfectly.

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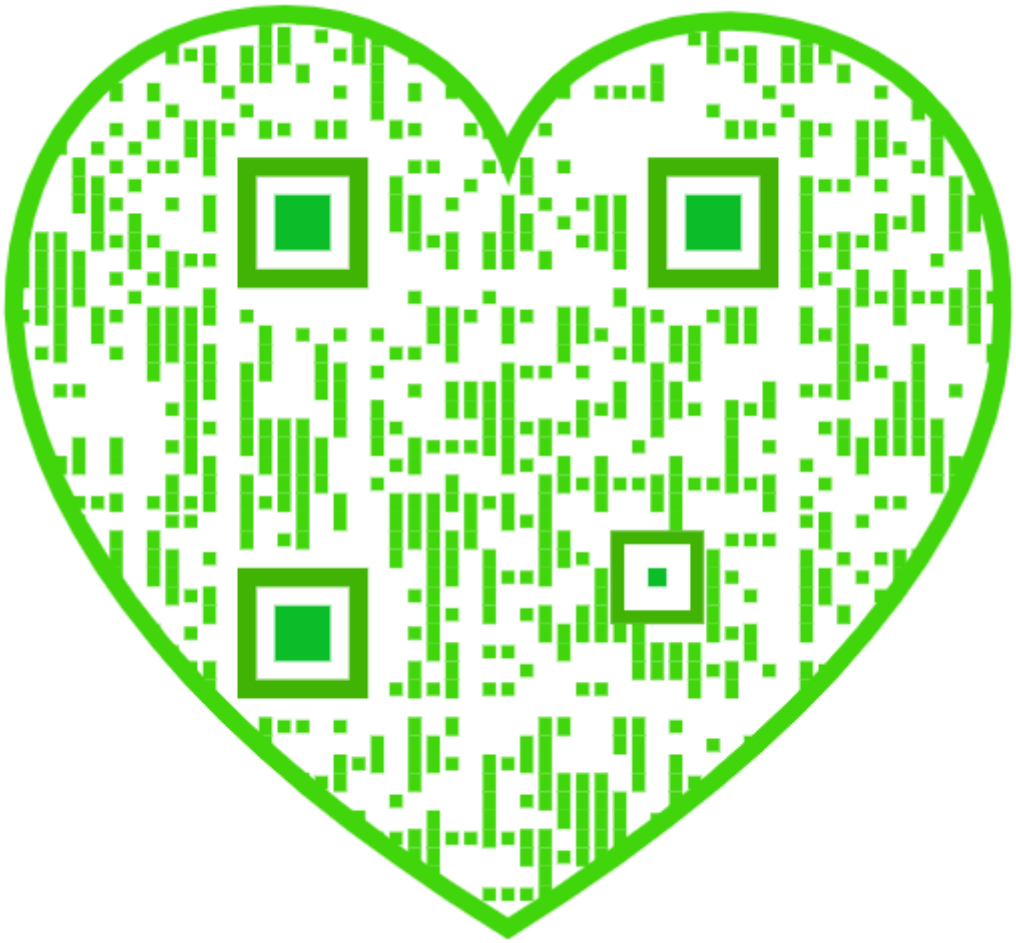

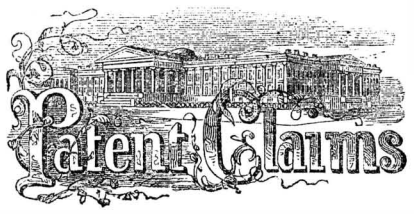

Issued from the United States Patent Office

FOR THE WEEK ENDING JULY 20, 1858.

[*Reported officially or the Scientific American.*]

*** Circulars giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

TUBE JOINTS FOR CONDENSERS—Horatio Allen, of New York City: I am aware that in lines of pipes for conveying water, short pipes of wood, banded at the ends with iron, have been used to connect the iron pipes, the iron pipe being driven into the wooden pipe, or the wooden pipe into the iron pipe.

But this combination is not one for making an imperfect joint tight, but is a combination of wooden and iron pipes, the joints of which shall not form the material used being imperfect.

And I do not claim such combination of wooden and metal pipes, as embraced within my device.

I claim making the joint formed by two metal surfaces (as in the joints of the tubes in the tube sheets of surface condensers, and other similar instruments) tight, by inserting between the tube and tube sheet a tube of seasoned or compressed wood, made either in one or several pieces, relying on the expansion of the wood after being saturated by water to make the joint tight, and on the freedom of the metal tube to move endwise without affecting the tightness of the joint, to avoid injurious results from the expansion and contraction of the metal tube, all substantially in the manner and for the purposes set forth.

CONNECTING THE ENDS OF RAILROAD RAILS—K. H. Allen, of Worcester, Mass.: I claim the combination of the rails, E E, elliptical or spheroidal band, D, chair A, and adjustable wedge F, all arranged and constructed substantially as and for the purposes set forth.

[The nature of this invention is in the use of a chair which extends from one tie to another, in conjunction with railroad rails which have open horizontal slots in their meeting ends, and an elliptical or spheroidal band, which passes through the slots in the ends of the rails and underneath the chair, and is fastened by an adjustable wedge firmly in place. This arrangement so secures the joints of rails that the weight of the engine and train over the same does not depress or deflect the point of junction to a greater degree than other portions of the rails are depressed. It also presents a safeguard against displacement of the rails either by thrust or lateral motion.]

KNIFE CLEANER—J. J. Banta, of Jersey City, of N. J.: I claim the combinations of the cushions, b and c, and hopper, e, with the spring, h h, the whole acting substantially as and for the purposes specified.

COMBINATION OF ELECTRO AND PERMANENT MAGNETS TO RENDER TELEGRAPHING MAGNETS EASY OF ADJUSTMENT—Edmund F. Barnes, of Brooklyn, N. Y.: I claim the combination and use in a telegraphic line, or in connection with telegraphic instruments, of the permanent magnet with the electro-magnet, arranged and connected substantially as and upon the principles set forth, to prevent the disturbing effect of atmospheric electricity, &c., as described.

I also claim constructing the permanent magnet, B, when used, substantially as described, as an armature of the electro-magnet, with soft iron inserted therein, substantially as set forth, to render its action more forcible in connection with the electro-magnet.

TWINE BOX—W. R. Bennett and C. Storer, of Boston, Mass.: We claim in combination with the box, A, the eyelets, g, attached to the shaft, D, and operating in the manner substantially as set forth.

Second, We claim the knife guard, E, constructed and operating in the manner substantially as described.

WASHING MACHINE—William Brown, of Duncannon, Pa.: I claim, first, The manner described of hinging the forward portion, b, of the rubber to the rear portion, b, of the same, for the purposes set forth.

Second, The manner described and shown of hinging the rubber, b b, to the uprights, in combination with the manner of suspending the uprights, a a, by means of slots, pivots and springs, for the purpose set forth.

[This washing machine consists of a tub with a fluted concave bottom and a fluted rubber, which is hung above, and vibrates over said bottom; the clothes are attached to the rubber so as to be washed between it and the concave tub bottom. The rubber is suspended by springs, so as to allow of any desired force being applied to the clothes, without the necessity of the operator being compelled to bear the labor of lifting the rubber to apply said force. It is also rendered flexible by hinged joints, so as to accommodate itself to any bunching of the clothes beneath it. This is one of the simplest washing machines ever patented, and it performs the operation of washing clothes in a manner somewhat similar to the human hands.]

MACHINE FOR SHARPENING GIN SAWS—A. H. Burdine, of Chulahoma, Miss.: I claim, first, The arrangement of the adjustable feeding pawl, L L, spring file frames, i j, and slotted or jointed adjustable frame, C D b a, substantially as and for the purpose set forth.

Second, The particular arrangement specified of the self-clamping and self-sustaining frame, C a b, in combination with the pawl, L, for the particular purpose of feeding old circular gin saws while on the shaft and in the grain frame, substantially as set forth.

Third, The particular manner shown of arranging the clamping part, C, of the frame, on the upper part, D, of the frame, for the purpose set forth.

[This machine is designed for sharpening old cotton gin saws without the necessity of removing them from the frame. The machine is exceedingly simple, and is placed on the saw, and feeds it by its own teeth. We have seen the machine operate, and it certainly does work perfectly. The saw teeth are sharpened with a bevel on each side toward the point, and a whole gin of saws can be sharpened in about five hours, whereas by hand it usually requires two or three days.]

PLOWS—G. D. Colton, of Galesburgh, Ill.: I claim arranging the frame, B, secured to the axle, C, as described, with the strap, n, cord, m, and windlass, G, the several parts being operated in the manner and for the purpose set forth. Also this in arrangement with the revolving colters and a double-pointed beam, all being constructed and operated substantially as described.

MACHINES FOR CUTTING OUT THE SOLES OF BOOTS AND SHOES—John Crawshaw, of Rochester, N. Y.: I claim combining the cutter and the pattern with each other, and with the wheel, D, by means of the pattern gear, m, pinion, o, groove, n, tongue, r, cutter carriage, c d e, slot, f, and the cutter stock, E, or their equivalents, the whole being arranged to operate substantially as specified.

[A notice of this improvement is given in another column]

FIRE BOXES FOR LOCOMOTIVE ENGINES—Leonard Crossman and Samuel Atkinson, of Elizabeth City, N. J.: We claim the arranging of the grate bars centrally in the bottom of the fire box of wood-burning locomotives and surrounding said grates with dead plates, when said grate bars and dead plates are susceptible of being removed or replaced substantially in the manner and for the purpose set forth.

MANUFACTURE OF HARD RUBBER GOODS—Gustavus Cuppers, of College Point, N. Y.: I wish to have it distinctly understood that I do not claim as my invention the heating or curing process, as it is called, nor the combination of india rubber and gutta percha with sulphur, nor any other combination already patented and described.

But I claim the improvement in the hardening or curing process of caoutchouc or india rubber and of gutta percha, by which articles wares, goods and merchandize may be manufactured into any desired size, form or shape, substantially as described.

STEAM HEATER—Chauncey A. Dickerman, of New Haven, Conn.: I claim the arrangement of the chest of steam-heating flues, I I I I I I, mutually parallel, and inclined as described, in combination with similarly inclined and parallel air flues, K, heated thereby, both the steam and the air having passed once through its flue on passage across the chest, is at once discharged to its final destination in the manner and for the purpose set forth. The arrangement or combination as thus described and represented I claim as an efficient and cheap apparatus.

SPRING BOLT—Edward Doen, of New Britain, Conn.: I claim the combination with the guided sliding bolt, A, and surface plate, B, of a loose or freely arranged spring, S, let into the body of the bolt, and protected or encased thereby for operation on, at points some distance apart, and with the bolt, and against the surface plate, substantially as described, for the purpose set forth.

GRINDING MILLS—Gerrett Erkson, of New York City: I claim combining with the two eccentric grinding plates having the said axis of rotation, substantially as described, a male and female nut, concentric with each other, and attached to and rotating with the eccentric plates, as set forth, and for the purpose specified.

MAKING WATCH CASES—Edwin Field, of Providence, R. I.: I do not claim, broadly, any peculiar formation of the faces of rolls, whereby metallic stock generally may be delivered therefrom finished in its required form.

Nor do I claim any peculiarity of form thereof, for working gold or other plated stock exclusively, or for delivering such stock in any required form or shape, in a finished state direct from the rolls.

Nor do I restrict myself to the precise form described, to the exclusion of another, or more perfect one for the purpose.

First, I claim the use of the rolls, S S, in connection with the rolls, F F, constructed and operating as specified.

Second, I claim the peculiar shaped threads, E 1 E 2, of the mandrel, E, to prevent flattening, and for properly stretching the center stock in coiling the same in the first instance, E', and for shaping and imparting a proper incline to the bevel stock in the second instance, E 2.

CARPENTER'S RULE—William O. C. Fritschler, of Brooklyn, N. Y.: I claim the arrangement and combination of the level, a, with the movable arm, l, furnished with a spirit level upon the center, so that by means of the arc, g, and the screw, h, the glasses, c and d, may be so placed as to indicate the precise position in relation to the "plumb and level," whatever may be the variation of angle the part b may necessarily assume, the said variation being indicated by the scale on the arc, e, all of which is fully described.

CANAL BOAT—James E. Gibson, of Port Carbon, Pa.: I claim in combination with canal boats made in two parts, so coupling the parts together that each shall have an up-and-down movement independently of one another, substantially as and for the purposes set forth.

SAW-FILING MACHINE—Heman How, of Georgetown, Mass.: I claim the crank shaft, P, operating as set forth, in combination with the slotted upright or moving frame, J, the flat spring, S, and the round metallic springs, L L, substantially as described and for the objects specified.

SEED DRILLS—J. W. Kirk, of Rising Sun, Md.; I claim a seed hopper which has at each point of discharge two passages arranged alongside, and one a little in advance of the other, and both used at the same time, in combination with a seed slide which has two passages similarly arranged, and of equal depth with each other, substantially as and for the purposes set forth.

[By the peculiar arrangement of duplicate discharge passages in the bottom of the hopper and in the distributing slide defined in the above claim, the grain is pushed in different directions. One stream does not interfere with the other, and is not so liable to choke. The stream is more steady and constant, and the grain consequently is not so much bunched when deposited into the soil. This improvement is a very simple one, yet it appears to be of considerable utility.]

MACHINE FOR PRESSING GRAPES—Henry Krause, of New York City: I do not claim to be the inventor of rollers for pressing grapes.

But I claim the soft roller, D, in combination with the adjustable hard roller, E, arranged and operated by means of the cogged gearing, in the manner and for the ostensible purpose substantially as described and shown.

CASTING HINGES—Conrad M. Lane, of Cincinnati, Ohio: I do not claim forming the joint of the hinge by casting teats at the ends of the knuckles of one leaf into corresponding recesses in the ends of the knuckles of the other leaf, for this has been previously done.

But I claim casting substantially as shown, the knuckles, a'' g, of the respective leaves, B D, so that the inner parts or sides of the knuckles will form parts of cylinders of smaller diameter than the outer parts to admit of the easy moving of the joint without additional labor or finishing as described.

[A description of this invention will be found on another page.]

MACHINES FOR DIGGING POTATOES—Malcom Little, of Clyde, N. Y.: I claim the arrangement of the fork, E, within and in combination with the roller, G, substantially in the manner and for the purpose specified.

MILL STONE DRESS—George W. Loy, of Jefferson, Texas: I claim having the two stones, A B, provided respectively with straight and curved furrows, disposed or arranged as shown and described, for the purpose set forth.

[This invention consists in having one stone provided with straight tangential furrows, and the other with curved furrows, whereby the millstones are rendered much more efficient in their operation then by the ordinary dress most generally employed, or by any of the improved dresses that have recently been used in a few cases.]

CASTING IRON KETTLES—Cornelius McGinniss, of Pittsburgh, Pa.: I claim constructing the metallic core as described, of three or more pieces, united by bolts, so as to be readily detachable, one of which pieces is a narrow central strip, which may be removed after the kettle is cast, and before it is sufficiently cool to remove the entire core, for the purpose of allowing the contraction of the casting without danger of bursting.

VAPOR BURNING LAMPS—Nicholas Mason, of Chelsea, Mass.: First, I claim the two holes, q q, in the wick tube, for the purposes set forth.

Second, I claim my cylindrical sheath, arranged and operating substantially in the manner and for the purposes set forth and described.

Third, I do not claim cutting off the gas by means of rolling valves, as this is common in steam engines, and in gas and water cocks and other lamps.

But I claim the double row or scries of rolling valves contained within the mouth-piece of the burner, arranged and operating in combination with each other, and with the throat-piece of the wick tube, substantially in the manner set forth and described.

PROPELLER—Datus E. Merick, of Cleveland, Ohio: I claim the special form of the wing described, having its angular position upon the shaft, in combination with the flange having its greatest depth at the central part of the periphery of the wing, and tapering therefrom each way to the edge of the wing, as set forth.

BREECH-LOADING FIREARM—James H. Merrill, of Baltimore, Md.; I claim converting what is known as the "Jenks' carbine" from a loose powder and ball-loader to a cartridge loader, viz.: by plugging up the vertical opening through which that gun was loaded, cutting away in rear of the barrel, so as to load at the rear end of the bore, and allowing the lever, toggle, and piston to come far enough back to admit a cartridge to be dropped in behind the bore, and then run up into the chamber, with a groove and pin to guide the toggle and piston, as set forth.

MACHINE FOR MAKING CHAIN—Edwin H. Perry, of Providence, R. I.: I do not claim the combination of a carrier on which the blank link is transported, a die or perforated plate by which the arms of the links are bent inward, and a forming guide or tube in which the chain is held and transmitted, as such combination is covered by the patent granted heretofore to Lauriston Towne, October 20, 1857.

But I claim, first, The perforated plate, F, or its equivalent, in combination with a former for striking up the body of the link, the two so combined performing the function of enabling the link after it is struck up in the die to be lifted out of the same for the purpose of being deposited in the next position necessary in the formation of the chain, substantially as described.

Second, I claim the arrangement of the slides, p p p, for bending over the arms of each link after it has been struck up in the die.

Third, I claim constructing the end of the tube wherein the chain is formed, in the manner substantially as described, so that it shall be enabled to perform the function of grasping the link when deposited in it, and retaining it at the same time, holding it firmly in place while the arms of the under link are being bent over it, as set forth.

Fourth, In combination with said tube I claim the adjustable contracting collar, for the purpose of regulating the degree of resistance which must be overcome in forming the chain, by means of which the chain can be, at pleasure, woven more or less compactly, as set forth.

METHOD OF FEEDING THE TOOL CARRIAGE IN TURNING LATHES—Adam Rennio, of Binghampton, N. Y.: I claim the combination of the lever, A, with the arms, D, and the jointed propeller, B B, with the racks, E and C, respectively, for the purpose of feeding the tool carrier, as described.

And I claim the back rest, L, for the purpose described.

MACHINE FOR MAKING AXE POLLS—George Reynolds, of Manchester, N. H.: I do not claim, broadly, the method described of manufacturing an axle poll, by compressing a bar of metal between dies or swages projecting from the face of the rolls in which they are set. Neither do I claim as new the use of a die provided with a groove or recess in which the head of the axe poll is to be formed.

But I claim, first, The use of a drawing die, D', provided with projections, o o' o'' o''', or their equivalents, substantially as described, so that the blank of metal when subjected to compression shall be thereby drawn out farthest at the corners, whereby the bit can be more completely welded into the poll, and the eye of the axe in consequence be made more perfectly, as set forth.

Second, I also claim making the lower die, D, with a recess or groove across its face of the form, substantially as described, so that the metal which forms the head of the axe poll shall be thereby crowded toward the edges of the head instead of being piled into a ridge in the middle, and at the same time a greater proportion of metal be forced into the back of the head, as and for the purposes specified.

Third, I claim the combination of the feeding fingers, I I' I'', or their equivalents, with one or more cams, J J', or their equivalents, so arranged and operated that at the proper moment of time, the blank of metal can be by the machine automatically fed between the dies, to undergo the several operations to which it is to be subjected, as described.

Fourth, In combination with the dies or rolls, an adjustable guide, S S, and gage, R, either with or without the spring fingers, V V, Fig. 7, for the purposes specified.

Fifth, The compressing clamp for holding the axe poll, and shaping the head of the axe, during the operation of bending, constructed and operated in the manner and on the principle substantially as described.

STRAW CUTTERS—Robert Sinclair, Jr., of Baltimore, Md.: I claim the described arrangement of the teeth, a a, upon the masticating and propelling cylinder, b, constructed with the nodular projections on either side and operating like molar teeth to propel and crush the fodder, as set forth.

RAILROAD SWITCHES—G. R. Smith, of Ithica, N. Y. I claim the rack and pinion at the base of a perpendicular rotating or partially rotating shaft, when combined with a spring lever and a circle or segment of a circle, said lever being fixed at right angles to said shaft, and playing on said circle or segment, and into slots in the same, and said segment or circle being horizontal.

Further, I claim the above named combination when further combined with a signal lantern, which lantern revolves wholly or in part, when adjusted to the top of said shaft, said lantern having different colored glasses, and revolving on an axis, drawn perpendicularly through the center of said lantern.

HEEL SHAVERS FOR BOOTS AND SHOES—Varanes Snell, of North Bridgewater, Mass.: I claim combining with the stock and the stationary knife the adjustable guard, so arranged as to be susceptible of being removed from the said stock, as set forth.

FIREMENS' TRUMPETS—Wm. Staehlen, of Williamsburg, N. Y.: I am aware that paraboloidal end pieces have been applied to trumpets, and I do not claim such device; but I am not aware that an end-piece and body, each of paraboloidal form have been previously used in the construction of speaking trumpets.

I claim the end-piece, C, and body, B, constructed in paraboloidal form, and arranged relatively with each other and the mouth-piece, A, substantially as and for the purpose set forth.

CLOTHES' DRYER—S. H. Tift, of Morrisville, Vt.: I disclaim the mere combination of a sliding hub with expanding arms, as such does not constitute my invention.

But I claim the combination of shaft, A, hubs, B and C, arms, D, and braces, E, with the sliding collar, F, and catch, G, the whole constructed, arranged and operating as and for the purpose set forth.

MACHINE FOR CUTTING BOTH BEVELS SIMULTANEOUSLY ON BARREL HEADS—A. D. Stewart, of Bennington, Vt.: I do not claim, broadly, the use of a concave cutter, nor do I claim, broadly, the employment of more than one saw or cutter upon an arbor.

But I claim the arrangement and combination of saws, f g, saw, J, and mandrel, H, as shown and described, whereby both bevels are simultaneously cut,

[A description of this invention appears in another column.]

STEAM STOVE—J. L. Sutton, of Norristown, Pa.: I claim the new manufacture of steam stove described, to wit: a stove or furnace and boiler, with two or more concentric radiators, around or above said boiler and furnace, and arranged to receive the air heated by said furnace and boiler, and impart additional heat to it as it ascends around and between them, substantially as described.

APPARATUS FOR HANGING UP AND CARRYING OFF PAPERHANGINGS—T. Van Deventer, of New Brunswick, N. J.: I claim first, The employment of the intermediate bands, l' l', in combination with the hanging-up belts, c c', and carrying off bands, t' t', substantially as described, the whole operating as set forth.

Second, The springs, 5 5, applied to the lath box, E, to operate substantially as and for the purpose set forth.

[A notice of this improvement will be found in another column.]

MANUFACTURE OF STEATITE ARTICLES—J. Von Schwarz, of Nuremburg, Bavaria: I claim preparing gas burners or other articles of manufacture from the natural substance known as steatite, in such a manner as to give said articles an intense degree of hardness, and also a capacity to resist high temperatures, substantially as set forth.

APPARATUS FOR RECTIFYING—Gardner Waters and J. W. Harnett, of Cincinnati, Ohio: We do not of course claim the principle of continuous distillation, nor any of the various modes by which Pisterious, Derosne, Coffey, and others have rendered its practical application more and more simple and easily regulated. Neither do we claim the beer and spirit columns or the general arrangement and mode of operating Coffey's apparatus.

But we claim, first, The use of solid plates, with bent pipes or their equivalents, instead of perforated plates in the beer column, in the manner and for the purposes set forth.

Second, The use of the exhaust steam regulator, in distillation, by this or other apparatus, whereby steam of any degree of tension may be taken from the boiler, and reduced to any less desired uniform pressure; and whereby the exhaust steam from engines may be regulated in like manner, using the exhaust steam from boilers, together or separately as may be desired, in the manner and for the purposes set forth.

Third, The combination of the beer and spirit columns, with the exhaust steam regulator, with or without the whistle valves acting as described and for the purposes set forth.

PLOWS—Walter Warren, of Penn Yan, N. Y.: I claim the described arrangement of beam, A, and its portion, G, with the moldboard, B, and its landside portions, E F, the whole being constructed as and for the purpose set forth.

LOOMS—Joseph Welch, of Philadelphia, Pa.: As a multiplier of the pattern wheel of looms has been used before, and patented by Barton H. Jenks, on the 24th October, 1854, I do not claim, broadly, increasing the capacity of said pattern wheel by means of a multiplier.

But I claim as an improvement in the said multiplying apparatus the arrangement and combination consisting of the extra ratchet wheel, G, and its pinion H, in connection either directly or indirectly with the pattern wheel; the adjustable pawls, C' and C'', on their actuating lever, D, and the prolongation, o, on the usual operating pawl, C, of the pattern wheel, the said devices or their equivalents, being arranged so as to effect the changes as desired, in number at any given point of the pattern wheel during its rotation, substantially as set forth and described.

ELECTRO-MAGNETIC HOUSE ALARM—Wm. Whiting, of Roxbury, Mass.: I claim the improved house alarm described, consisting of a combination of the following elements, viz.: First, a series of electro-magnetic circuits; second, an indicator to designate the respective circuits; third, an alarm apparatus; fourth, the window or door springs—the whole operating as set forth to sound the alarm, and indicate the circuit attacked.

MACHINES FOR HULLING AND CLEANING RICE—David Henwood and James Stephens (assignors to themselves and T. F. Rowland), of Brooklyn, N. Y.: We claim the cylinder, F, provided with wedge-shaped spiral grooves, inclining outwards and downwards, substantially as described, in combination with the stationary india-rubber lining, D 2, or such equivalent lining that is firm enough to hull the grain, and yielding enough not to break much of it in the process of hulling.

We also claim making the top of the cylinder, F, convex or conical with curved wedge-shaped grooves, as described, in combination with the stationary adjustable disk above it, lined with india-rubber, gutta percha, or some equivalent substance for the purpose set forth.

We claim a cylinder covered with wire card clothing, in combination with a cylinder of perforated sheet metal, when both are made to revolve in opposite directions, for the purposes set forth.

We claim the huller covered by the first claim, in combination with the scourer covered by the fourth claim, arranged and operating as described.

FLOURING MILLS—Samson Wolff, of Vicksburg, Miss.: I claim increasing or decreasing the effective grinding action or friction of the stones, B B, without the necessity of changing the distance between the grinding surfaces, by having the spindle, C, of the running stone, B', arranged between an unyielding, but adjustable step, D, and a pivoted weighted yielding lever, J J, in the particular manner specified, for the purposes set forth.

[By this invention any necessary additional weight can be given to, or any surplus weight removed from the running stone in such a manner that said stone, although heavily weighted, will act with a pressure which can be counteracted by any superior resistance of the grain or other object between the stones, as in the event of clogging of the grain from too great moisture or ununiform distribution of feed, and in perfect delivery at the periphery of the stones, and consequently the flour will be kept discharged in a cooled state, and the miller enabled to adjust his grind surfaces to suit the amount of steam power he has on hand. This is certainly a good improvement, an engraving of which will appear shortly.]

COTTON PRESSES—R. G. Williams, of Hannahatchee, Ga.: I claim so arranging the press in relation to the screw that any required length of lever for operating the press may be obtained, the press resting on the upper main sill, A, instead of resting on the ground sill, as set forth.

CLOTHES' RACK—George Young, Jr., of Saratoga Springs, N. Y.: I claim the arrangement of the folding timbers, b b b b, with the central timber, a, by which the said folding timbers, when extended form supporting legs in combination with the lower arms, d d, widened for the reception of the supporting pins in the manner and for the purpose set forth.

SOLDERING IRON—H. J. Behrens (assignor to Charles S. Pomeroy), of New York City: I do not claim the use of a hollow soldering iron, so made for the purpose of receiving a red hot piece of metal to increase or con-

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tinue the heat of the surface for a longer space of time, for such contrivance is not new.

But I claim the use of a hollow soldering iron, containing solder, with or without a valve to regulate the flow thereof, as substantially set forth.

I also claim the combination of a hollow soldering iron containing solder, with an opening through which the solder may pass as required in the process of soldering, its delivery being automatic to its use.

STRAW SHAKERS—Leonard Ellig, of Mill Creek, Pa., assignor to Andrew Garrett, of Myerstown, Pa.: I claim, first, The movable bottom, w, in combination with the arms, 4 and 5, and spring, p, as set forth in the specification.

Second, The movable cap, a, adjusted as described and for the purpose set forth.

BURNERS AND WICK TUBES FOR VAPOR LAMPS—M. Safford (asignor to himself and G. P. Kinney), of Boston, Mass.: I claim the combination of the auxiliary wick with a lifter or rod, or with the same and extinguisher, so as to enable such wick to be moved in its tube in manner and for the purpose essentially as specified.

I also claim, in combination with the vapor generator, and its auxiliary wick tube, f, a closing cap or extinguisher, and one or more conduits, n n, applied in the wick tube, substantially in manner as specified, the whole being to produce effects as stated.

I also claim a foraminous wick tube, or its equivalent, in its combination with a main wick and an auxiliary wick applied to it, and to operate with it, substantially in manner as explained.

HORSE POWERS—Wm. Rider (assignor to himself and J. B. Sweetland), of Almont, Mich.: I do not claim broadly, a worm wheel and screw, as that is a well-known mechanical device.

But I claim the arrangement and combination, as shown and described, of the right and left screws, J J', placed in the shaft, K, in connection with the worm wheels, I I, which gear into the screw, J J', and are rotated from the driving wheel, D, by means of the gearing, F G G.

[A right and left screw is placed on the shaft from which the power is taken, and arranged with worm wheels and driving gear, whereby a simple device is obtained, and the requisite degree of speed transmitted from the driving shaft to that from which the power is taken, with the least possible amount of friction.]

FLUID METER—E. D. Weatherbee, (assignor to himself and Lorenzo Harding), of Worcester, Mass.: I do not wish to be understood as confining myself to the exact shape or proportion described, but to vary them as may be found convenient, so long as I keep the same principles or modes of operation.

What I claim is, first, The arrangement of the weighted tube, D, the vessels, H, and A, when constructed and operating substantially as set forth.

Second, I claim the combination of the siphons, J J, with the vessels, H H, and tubes, G, with valves, I I, for the purposes specified.

CONVERTING ROTARY INTO RECIPROCATING MOTION John J. Weeks (assignor to Susan Weeks), of Locust Valley, N. Y.: I claim forming the oblique arm, E, on the rotating shaft, D, and placing the collar or hub, F, with rod, H, attached on said arm, the lower end of the rod, H, being fitted in the slide, I, substantially as and for the purpose set forth.

[This invention consists in forming an arm obliquely on a rotating shaft, and having a collar fitted loosely on this arm, the collar having a rod attached to it at right angles, and the lower end of the rod fitted loosely in an aperture in the slide, to which a reciprocating movement is given from the shaft, or a rotary motion given the shaft from the slide.]

DESIGNS.

STOVES—Garrettson Smith and Henry Brown (assignors to J. G. Abbott and A. Lawrence), of Philadelphia, Pa.

PITCHERS—George W. Smith, of Hartford, Conn.

Our Reward.

Often in this world of ingratitude and selfishness where every man is for himself, we are pleasantly surprised on opening our letters, to find that many contain thanks, and kind expressions of good-will, proving that inventors have not yet been corrupted by this world's ways. One morning last week we received four such, from which we make the following extracts:—

E. Sirret, Jr., of Buffalo, N. Y., writes: "I have received the patent which you secured for me. I am very thankful for the efficient manner in which you conducted my business; and when I or my father have more to do in that line (as we hope we shall soon) we shall most certainly call upon you again."

B. Hazen, of Cincinnati, Ohio, says: "I have received from the city of Washington my Letters Patent for a corn husker, for which please accept my very grateful acknowledgments."

Joshua Tetlow, of Taunton, Mass., says: "I take great pleasure in informing you that the patent on my cotton gin, issued on the 13th inst., and that I received it this morning. I feel glad that I entrusted you with the preparation of the necessary papers; and I assure you that if ever I should have any more patent business, I shall surely engage you to attend to it."

John F. Taylor, of Charleston, S. C., remarks: "I have this day received my Letters Patent, and thank you for the promptness with which you have attended to all business I have ever entrusted to your care;" and again he says, "I would also state that I have been a regular subscriber to the SCIENTIFIC AMERICAN for a number of years, and have received from it much valuable information."

These and many more of a similar character which we receive daily (the above being but the result of a single mail) give us much pleasure and satisfaction, stimulating us ever to watch with care our clients' interests, and constitute apart from business relations, our almost hourly reward.

To Restore Writing.

Many documents that have been written with bad ink after a certain time fade, especially if they have been kept in a damp place, or if the paper that has been used has been over-bleached in its manufacture. Sometimes ship letters get wetted with sea water, and many other causes obliterate writing that is of much value. In nearly all instances such writing may be restored, or at least rendered legible, by brushing over the half distinct lines with a solution of prussiate of potass with a camel's hair pencil. The solution may be made by dissolving about half a teaspoonful of prussiate of potass in a tablespoonful of boiling water. For certain chemical reasons this does not answer in all cases, and when it fails we may use the following with good hopes of success:—First, a strong infusion of tea, made with a teaspoonful of black tea in half a cup of boiling water; or, secondly, a solution of carbonate of soda made in the same manner; or, thirdly, a quarter of an ounce of protosulphate of iron (green vitriol) in a like quantity of water. A last resource is a solution of sulphuret of potassium (liver of potash) of about the same strength as the preceding solutions. In trying to restore writing, we ought to begin with only one or two words, because if the first solution does not answer, we then have an opportunity of trying the others successively until we discover which answers best; but, as a general rule, it may be relied on that the first-named is the most likely. These trials are equally adapted for writing upon parchment as on other material. S. PIESSE.

Longevity of Persons Engaged in Different Occupations.

The Legislature of Massachusetts have had some tables prepared to show the mean average of life attained by individuals engaged in various employments, and from which we cull the following interesting facts:—Bank officers are the longest lived, their average being 68 to 76; next judges and justices, 65, and then agriculturists whose average is from 63 to 93. Clergymen, coopers, gentlemen, public officers and shipwrights average from and between 55 and 60. Blacksmiths, butchers, calico printers, lawyers, hatters, merchants, physicians, and ropemakers attain ages varying from 50 to 55. Carpenters, masons and traders live from 45 to 50. Bankers, editors, jewelers, manufacturers, mechanics, painters, shoemakers and tailors average from 40 to 45. Machinists, musicians, and printers live from 35 to 40, and clerks, operatives and teachers are the shortest lived of all being, only from 30 to 35. Of course, it is not necessary that a person who follows any of the above businesses should die at a definite age, but still the table gives a very good test as to the effect of employment in wearing out the human frame.

Gold Solders.

No. 1.—Composition: Gold, 4 parts; silver, 3; copper, 1; zinc, ½.

No. 2.—Gold, 3; silver, 3; copper, 1; zinc, ½.

No. 3.—Gold, 2; silver, 3; copper 1; zinc, ½.

The gold, silver and copper must be fused in a crucible, before the zinc is added, because the latter is a volatile metal. When these metals are completely fused they must be well stirred, and run into bars. Solder No. 1 is is for gold sixteen carats fine and upwards; No. 2 for 14 carat gold; and No. 3 for gold of lower qualities. If more zinc is added to any of the above solders it will *flow* at a lower heat, but the color is not so good. If care is exercised by any jeweler in making these solders, they will be found sufficient for all his soldering operations. D. J. W.

The Bottom of the Atlantic.

It has now been satisfactorily ascertained by Lieut. Maury that the basin of the Atlantic ocean is a long trough, separating the Old World from the New, and extending probably from pole to pole. From the top of Chimborazo to the bottom of the ocean, at the deepest place reached by the plummet in the northern Atlantic, the distance in a vertical line is nine miles. The deepest part of the north Atlantic is probably somewhere between the Bermudas and the Grand Banks. The waters of the Gulf of Mexico are held in a basin about a mile deep in the deepest part. There is at the bottom of the sea between Cape Race and Newfoundland and Cape Clear in Ireland, a remarkable steppe, which is already known as the "telegraphic plateau." The great circle distance between these two shore lines is sixteen hundred miles, and the sea along this route is probably nowhere more than ten thousand feet deep.

Novel Insect Trap.

Patentees of fly and other insect traps had better sell out their inventions at the highest offer. Our reason for this advice will be shown by the following:—An Illinois correspondent gives us an account of a new insect trap that will no doubt be very successful. He says—"In the first place, you must procure a large toad, such as St. Patrick banished from Ireland (good luck to him), which are easily tamed, then make a small box with a hole near the bottom, so that the toad can put his head out; drop some molasses on his back and put him in the box; his tongue is three inches long, and he can catch any insect that comes within his reach. This trap is not handsome but useful." The inventor thinks it especially applicable for catching fleas, but if we should chance to have a flea for a bedfellow, we should certainly prefer his company to that of a toad alongside in a box, but the suggestion is ingenious and decidedly novel. What next in the trap line? We should like to know.

A Compensating Clock Pendulum.

A clock recently introduced in England has a peculiar compensation glass pendulum, and a barometric contrivance, to prevent the error arising from the density of the atmosphere. The metallic compensation is effected without any friction, by the ascent and descent of two spring levers, with three adjustable weights, and which lengthen or shorten as they rise or fall. The mode of compensating is regulated by a screw in the top of the ball, which, in case of heat, is moved towards the center of motion of the spring lever, or in the contrary direction in case of cold. The glass rod is attached to the pendulum spring by means of a screw cut on it, and below a glass regulating nut works into a glass screw, cut on the bottom of the pendulum rod.

A Fat Fish.

The siskawit, a fish of Lake Superior, is reported to be the fattest fish that swims either in fresh or salt water. The fishermen say that one of these fish, when hung by the tail in the hot sun of a summer's day, will melt and entirely disappear except the bones. In packing about fifty barrels, a few seasons ago at Isle Royale, one of the fishermen made two and a half barrels of oil from the heads and leaf fat alone, without the least injury to the marketableness of the fish. Besides this leaf fat, the fat or oil is disseminated in a layer of fat and a layer of lean throughout the fish. They are too fat to be eaten fresh, and are put up for market like the lake white fish and Mackinaw trout.

Vacancy in the Patent Office.

Since the discharge of the chief examiner from the steam engine department of the Patent Office, some months ago, many complaints have been made by inventors of steam machinery that their cases are not acted upon, while applications filed upon inventions in articles coming under different classes are almost immediately taken up and disposed of. We are assured that this cause of complaint will be speedily removed, and we trust our friends who have cases pending in the engine class will use as much patience as they can, and we will do all in our power to facilitate the Office in finding a capable person to take charge of the above department. The delay is no fault of ours. Have a little patience, gentlemen! Your turns will surely come.

Method of detecting Decay in Timber.

We learn from the *Cosmos* that a simple method has been adopted in the shipyards of Venice, from time immemorial for testing the soundness of the timber. A person applies his ear to the middle of one of the ends of the timber, while another strikes upon the opposite end. If the wood is sound and of good quality, the blow is very distinctly heard, however long the beam may be. If the wood was disaggregated by decay or otherwise, the sound would be for the most part destroyed.

Recent Patented Improvements.

The following inventions have been patented this week, as will be found by referring to our List of Claims:—

MACHINE FOR CUTTING THE HEADS OF CASKS.—A. D. Stewart, of Bennington, Vt., has invented an improvement in that class of machines for cutting cask heads in which circular concave saws are used. The invention consists in using in connection with a circular concave saw, and on the same mandrel, a cutter formed of two or more saws, arranged in a novel way, whereby the heads are cut out from the stuff, and a bevel cut on both sides of the heads at one operation, the work being performed in a very perfect manner.

SOLE CUTTER.—By an arrangement of a cutting knife in a proper frame, this inventor causes it to follow a pattern; and with its aid any number of boot and shoe soles can be cut from leather or other material exactly according to a given pattern, by the mere turning of a crank. John Crawshaw, of Rochester, N. Y., is the inventor.

APPARATUS FOR HANGING UP AND CARRYING OFF PAPER-HANGINGS.—Wall paper being printed in such great lengths requires some system of laths over which the paper can be loosely thrown to dry. This invention consists in a certain arrangement of belts for carrying the laths, whereby, as the paper is formed into festoons, the sides of the festoons are prevented striking each other, and smearing, or otherwise injuring, the wet impression or coating. It further consists in the application of springs to the lath-feeding box, to allow laths of varying thicknesses to be used, and to permit laths that may be warped to pass through, and yet never to allow more than one lath at a time to pass out. The inventor is Theodore Vandeventer, of New Brunswick, N. J.

MODE OF CASTING HINGES.—This is an improvement in casting that kind of hinge in which a central pin is dispensed with, and a jointed connection formed between the two parts or leaves of the hinge by means of seats or projections at the ends of the knuckles of one leaf, a part of which fits in a corresponding recess in the ends of the knuckles of the other leaf, the joint being formed by casting one part in a mold partly formed by the other part, or in other words, casting one part with the other. The invention is designed to obviate the difficulty hitherto attending the free movement of the joint, and to dispense with the labor or finishing now requisite, in order to perfect the hinge when cast in the usual way. This is effected by casting the knuckles of such form that their inner halves will be portions of cylinders of less diameter than their outer halves, and thereby allow a space between the face side of each knuckle, and the edge of its adjoining leaf, so that a perfectly free moving joint is obtained when the hinge is cast, no extra labor or finishing being required. Conrad M. Lane, of Cincinnati, Ohio, is the inventor.

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New Inventions.

Patent Safety Air Pump Attachment.

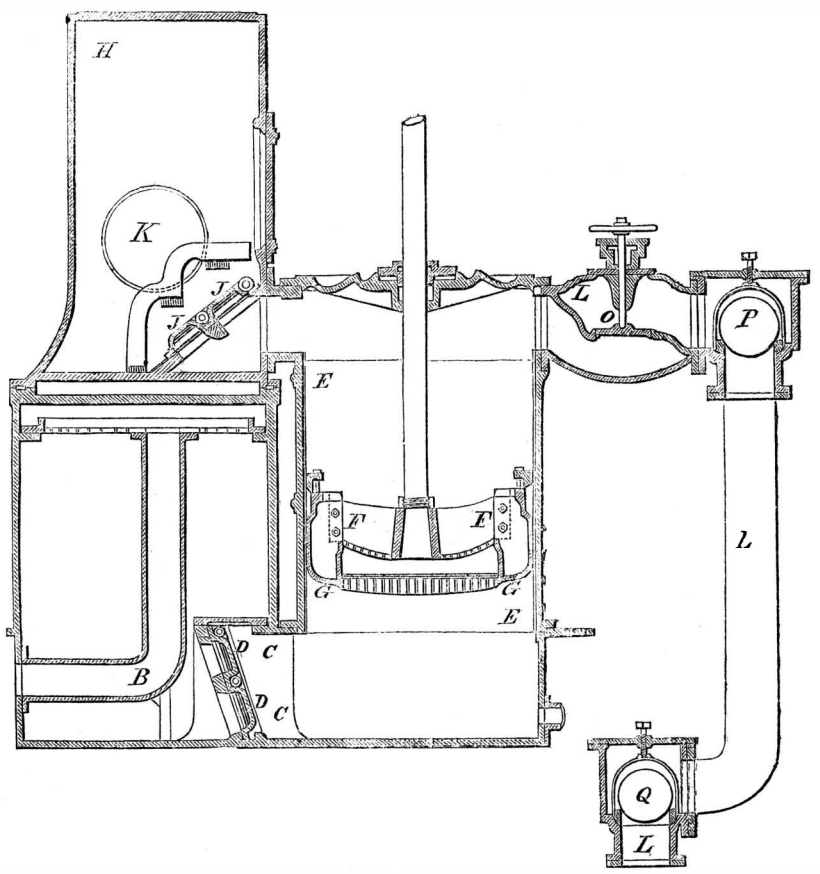
This improvement is designed to render nearly the whole capacity of the air pump of a marine engine available as a water pump to free the hold of a ship in case of accident, or from the ordinary accumulation of bilge water, without in any way interfering with its efficiency as an air pump, or impairing the vacuum in the condenser.

Our engraving represents a vertical section of one of the air pumps, condensers and hot wells of the steamship *Arctic*, lost some years since between Liverpool and New York. The condenser is represented provided with the ordinary injection pipe, B, to which a bilge injection may be attached if desired. A channel way, C, provided with foot valves, D D, leads from the condenser to the air-pump, E, in which moves a piston, F, having in it a proper bucket valve and seat, G G. This pump is in connection with a hot well, H—proper delivery doors, J J, being applied between the two—which hot well communicates with the outside of the ship, through a pipe, K, commonly known as a discharge or waste pipe, through which the air, water, and vapor delivered by the air pump pass overboard. What constitutes this improvement is the attachment to the body of the pump, near the top thereof, of an independent suction pipe, L, which pipe, L, extends down into the hold of the ship, and is provided with a screw stop valve, O, and two ordinary ball valves, P Q, one of which latter may be dispensed with if desired. When the stop valve, O, is closed, the air pump, E, operates precisely the same as before the pipe, L, is attached. When, however, the valve O is opened, there being water in the hold of the vessel, and after the piston, in its upward stroke, has delivered the water from the condenser, and commenced its descent, leaving a vacuum above the bucket, water will, by the pressure of the atmosphere, rise through the pipe, L, lifting the ball valves, P and Q, in its passage, and fill the pump as the piston descends, until the air, vapor and water below the piston, drawn from the condenser on its previous up stroke, by their superior pressure, open the bucket valve of the piston. The said bucket valve then passes into the channel way, C, and again takes hold of the condensing water, in the same manner that it did on its previous stroke, and as it re-ascends will again exhaust the condenser of water, air and vapor, and at the same time deliver the whole contents of the air pump, comprising the water drawn from the condenser, and that drawn from the hold of the vessel, through the pipe, L, into the hot well, H, and from thence through the discharge pipe, K, overboard, and thus it will continue to act as long as there is water in the hold.

Another advantage results from the use of this invention in the fact that all the chips, coal, &c., that may be drawn from the hold, instead of being drawn into the condenser and through the channel way, C, and foot and bucket valves, D G, tending to choke them up, as is the case in the employment of the ordinary bilge injection, is drawn directly into the pump, above the bucket and foot valves, and thence through the hot well and pipe, K, overboard. It, moreover, gives a pumping capacity far exceeding any pumping apparatus heretofore known, and being a necessary part of the main engine, it is not liable to fail, and is ready for all emergencies. It does not require increased machinery except the simple attachment of the suction pipe, L, and valves, O P Q, but simply renders the machinery already working on board steam vessels at all times available, without additional power to the pumping capacity demanded for public safety, and it is applicable to all marine condensing engines now in use.

To illustrate the benefits of this invention as a means of security to life and property, the inventor mentions that had the ill-fated steamer *Arctic* been provided with this simple attachment, her hold would have been kept sufficiently free from water to have enabled her to have been properly sustained and brought safely into port. To substantiate this opinion he gives certain facts in relation to this vessel as follows :—The two air pumps of the *Arctic* were each five feet diameter and five feet stroke, making 196 cubic feet per revolution of the engine. The average number of these revolutions per minute was twelve, showing an aggregate of 2,352 cubic feet, equal to 67 tuns of water per minute or 4,020 tuns per hour, which the air pumps on board the *Arctic* were capable of discharging had

BARNUM'S SAFETY AIR PUMP ATTACHMENT.



they been provided with this simple attachment. Her whole tunnage was less than 3000 tuns, so that the capacity of the air pumps to discharge water from the hold per hour, at their average speed, exceeded the actual tunnage by more than one quarter, and therefore it is clear that with this improvement, it would have been impossible for her to sink under a leak less than would sink her under ordinary circumstances in one hour. It follows, then, that as the *Arctic* was over five hours in filling and sinking, had this improvement been attached to the air pumps, the noble vessel with all her treasure in life and property would in all likelihood have been safely brought into port.

This invention was patented May 4, 1858, and any further information may be obtained from the inventor, Daniel Barnum, No. 2 Sussex place, Jersey City, N. J.

BRADEN'S IMPROVED LOCK.

Fig. 1

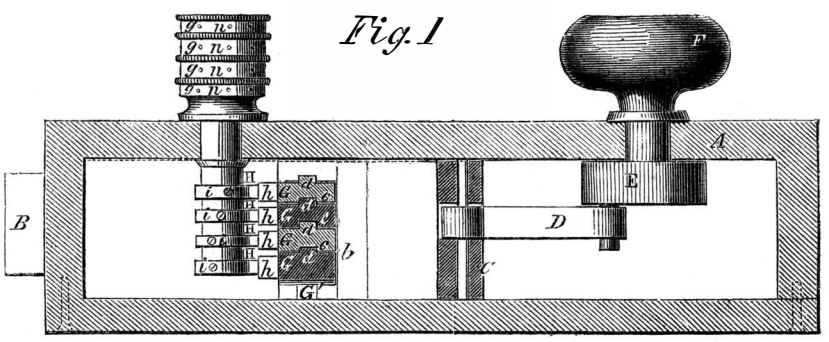
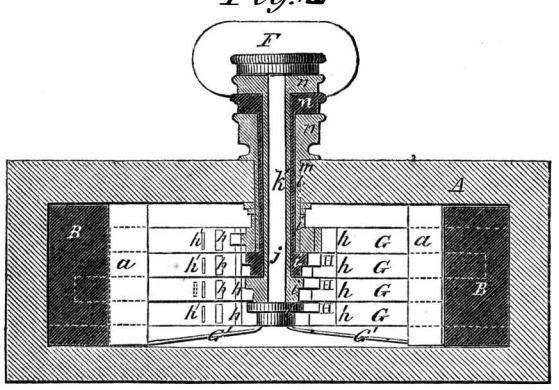


Fig. 2



This invention consists in the use of a series of slides provided with teeth or racks, and arranged with a bifurcated bolt into the parts of which the ends of the slides work or pass, and a series of bits attached to separate arbors placed one within the other, and operated by means of keys or knobs.

In our illustrations, Fig. 1 is a horizontal section of the lock, and Fig. 2 a transverse one, and from them and the following description the lock will be understood.

A represents the case of the lock which is of metal and of the usual quadilateral form. The bolt is formed of two bars, B, being connected at their inner ends by the bar, C, that is connected by a rod, D, to a crank pulley, E, on the end of the shaft of the knob, F. By this means the bars, B, are moved in and out by turning the knob, F. The bars, B, work, one at the upper end and the other at the lower end of the case, A, and between the top and bottom plates of the case and longitudinal plates, *a a*, the inner ends of *a* being connected to a bar, *b*. G. represents a series of slides which are placed one over the other and fitted together, each slide having a longitudinal recess, *c*, made in it, at one side of its center and a projection, *d*, at the opposite side, the ledge or projection of one side fitting into the corresponding recess of its adjoining one. The ends of the slides, G, pass through openings in the plates, *a;* corresponding openings being made in the bars, B. The slides, G, are made of such a length that when adjusted centrally with the case, their ends will be flush with the outer edges of the first mentioned opening, and springs, G′, are fitted in the case to keep the slides in their proper place. To the front side of each slide, G, a series of teeth, *h*, are attached, and in addition to these there are some yielding or elastic teeth, *h′*, placed one at each end of the teeth, *h*, giving or yielding only in one direction, and being perfectly rigid in the other.

H represents a series of bits which are attached to bosses, *i*, each of these being attached to arbors, *j k l m*, fitted one within the other, each arbor being allowed to work independently of the others. Each arbor passes through the outer plate of the lock, and each is provided at its outer end with a knob or thumb wheel, *n*. The bits, H, are so placed that one will be opposite each slide, G, and the bits are placed at such a distance from the teeth, *h*, of the slides, that the bits will gear into them, and move the slides as the bits are turned.

The bars, B, when pushed outward from the case, A, are retained in that state by the slides, G, which are moved promiscuously, so that their ends will project into the openings in B, some of the slides fitting into one bar and some into the other, and in order to shut the bars back into the case, A, the slides, G, must all be so moved that their ends will be flush with the outer edges of the openings in the plates, *a a*. This is effected by having a mark, *g*, on each knob or wheel, *n*, coinciding with the position of its bit, A, and then when the lock is locked, the person must note the movement he gives each slide by counting the turns of the knob or wheel, *n*, through which it was moved, or an index plate may be attached to the outer plate of the lock in order that the position of each slide may be noted by the person who locks the lock. This being done, the same person of course can move the slides in proper positions, so as to liberate the bars, and therefore allow them to be moved back by turning the knob, F. The elastic teeth, *h′*, are to prevent the bits, H, being stopped, when the slides have been moved the full extent of their movement in one direction, the teeth, *h′*, yielding to the action of the bits. When, however, the bits act upon the teeth in the opposite direction, that is, the direction in which the slides can move, the teeth, *h′*, will not yield or give, and the slides will be moved, the teeth, *h′*, acting in the latter case as stationary teeth. By means of the yielding cogs the positions of the slides are prevented from being discovered by being tampered with, the bits being allowed to turn completely round any number of times. One or more of the slides, G, may be used, and the lock therefore made as complex as desired, and placed beyond the reach of burglars.

This lock is the invention of Mr. Joseph A. Braden, of La Grange, Ga., to whom a patent was granted June 8, 1858, and from whom any further information can be obtained.

New Horse Feed.

Mr. R. Long has obtained a patent in Great Britain for an improved preparation of food for cattle, which consists in mixing hay, straw, and lucerne, chopped small, with oats, bruised or partially crushed, and cementing them together with vegetable mucilage mixed with common salt, then pressing them into cakes.

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Scientific American.

NEW YORK, JULY 31, 1858.

The Lives of Eminent Men.

In lately reading the life of the French mechanician Jacquard, whose name has been immortalized by his inventive genius, we were forcibly struck with a conviction of the important lessons conveyed in the simple narrative of his every-day transactions, and of the benefits that would accrue to the youth of our country if the lives of such eminent men, whether distinguished in the world of arts, letters, or other useful avocations in life, could be displayed before them in the same familiar and instructive form. Knowing full well the passion we are sometimes apt to contract for the most insignificant appendages to the favorite objects of our attention and regard, we do not wonder that the historian who properly comprehends his task does not hesitate to descend into what at first sight might be thought unimportant details. We think it is much to be desired, and should always be an object of attention to those who are employed in writing the lives of eminent persons, or in compiling materials from the works of others, to select such of their actions as are most characteristic of their genius and disposition. A trifling and seemingly inconsiderable action, an expression or word in a man's unguarded moments at home or at ease among his most intimate friends, often conveys a perfect idea of his genius and character, and serves as a key to most of the greatest and important actions of his life. And if these inferior indications of a man's life ought not to be omitted, much less should the greater and more important elements of his ability and character.

It must ever be acknowledged in favor of those who undertake to instruct us in the transactions of past ages, who faithfully draw from life, and accurately delineate the actions and characters of mankind, that they open before us a noble fund of rational enjoyment, and are, at the same time, of the most important service in directing the minds of men to virtue, and exciting them to an honorable and worthy conduct. Whilst they are calling forth into exercise the most generous principles of the human heart, in instructing us in the nature and obligations of private and social virtue, it must be allowed that they increase our general knowledge. The actions and characters of men it is alike their province to describe, with this principal difference, that the former represent them in the public and more active scenes of life, and as they affect the general course of human affairs, whereas the latter, without omitting the public, leads us into the more private and domestic situations, makes us acquainted with the whole circle of a man's friends, lays open his connections and correspondence, the plan of his education, the method of his studies, his leading views in life, and the manner in which he employed his time, and introduces us to the knowledge of a variety of circumstances of the greatest importance in judging of his character and manners the whole affording very useful hints for others to improve upon.

There have been many philosophers, mathematicians, mechanics, and others, at various eras of history, who have in a remarkable manner supported their characters, distinguished themselves in their professions, and merited favor by the service they have rendered mankind, and whose lives if properly detailed, would serve as instructive lessons to others. To render them of general and extensive use, however, they should not only be written with the greatest truth and exactness, without the errors too often consequent upon the partialities of friendship or the influence of prejudice, but those gentlemen who have taken upon themselves the noble duty of perpetuating their memories and worth should search into the records of the periods in which they existed, and collect and dispose other facts of interest which have transpired in connection with them. Upon such a plan as this it would be easy to see what advance any art or science had made at a particular time, who were a man's predecessors in the same art or profession, and what advantage he enjoyed from them. As we come down, as materials increase, and knowledge and the arts advance, a more extensive account of such cotemporaneous and useful events may be given, and a correspondingly increased interest and benefit attached to the lives of praiseworthy characters, so that in celebrating the virtues of good men who have been the ornaments of human nature, and whose works have benefited their fellow men, the candid chronicler will not only perform a highly useful and delightful duty, but convey to his readers the most comprehensive and instructive lessons upon the subjects pertaining thereto.

The Habitual Use of Spirits.

We are all of us more or less aware of the directly visible injurious effects produced by the habitual use of intoxicating drinks, in the follies and vices, the absorption of all the generous feelings, all the tender humanities and sweet charities of love, while the heart is held under its sway; but few of us know the full extent of the change produced by it, both in the mental and corporeal faculties. The *British and Foreign Medico-Chirurgical Review* shows that the habitual use of spirits arrests that metamorphosis of tissue which is necessary for health, leaving the effete tissue as a useless burden in the body, to be converted into that least vitalized of all the organic constituents, oil and fat, till finally life itself is clogged at the fountain-head. Thousands of men, according to the *Review*, who have never been inebriated, annually perish, having shortened their lives by tippling a little every day. The dram arrests the metamorphosis of tissue, another dram is taken before this arrest ceases; the re-action, thus postponed, becomes more intense; the depression is excessive; more drams are taken; and so, in the end, without ever having been intoxicated, the tippler sinks into the grave, presenting the strange anomaly of a reasonable being periodically applying a poison which is sure to impair and eventually destroy the vitality of the body, and divert the nobler impulses of the heart from that course which consecrates it to a heaven-born life. The effect of drinking spirits is different from that produced by wine, for wine is rarely used except at meals, so that the effects have time to pass away before a second dose becomes due, and hence no craving for an increased quantity is experienced. Men are now living, in consequence, in robust old age, who have taken the same identical number of glasses of wine daily for half a century, without feeling it necessary to increase the quantity.

Effect of too much Acid on the System.

There are many persons in the world, who, thinking themselves either too thin or corpulent to accord with their *beau ideal* of symmetry and beauty of person, are constantly exercising their minds with a view of increasing or diminishing their rotundity, and in many cases applying remedies for their supposed defects, which eventually destroy their health. Young ladies of full habit, fearing further innovation upon the symmetry of their waists, are not slow to resort to copious and constant draughts of acidulated liquids, without reflecting that they impair, and, in fact, arrest the operation of the digestive organs, when taken beyond a certain point. There is reason in the vulgar notion, unhappily too fondly relied on, that vinegar helps to keep down any alarming obesity, and that ladies who dread the appearance of their graceful outline in curves of plumpness, expanding into fat, may arrest so dreadful a result by liberal potations of vinegar; but this can only be accomplished at the far more dreadful expense of health. The amount of acid which will keep them thin will destroy their digestive powers. Portal gives a case which should be a warning:—"A few years ago a lady in easy circumstances enjoyed good health; she was very plump, had a good appetite, and a complexion blooming with roses on a polished ivory ground-work. She began to look upon her plumpness with suspicion, for her mother was very fat, and she was afraid of becoming like her. Accordingly she consulted a woman, who advised her to drink a glass of vinegar daily. The young lady followed the advice, and her plumpness diminished. She was delighted with the experiment; but she soon began to experience the evil effects. A cough and slow fever came on, with a difficulty of breathing; her body became lean and wasted away, swelling of her lower limbs and feet succeeded, and a diarrhea terminated her life."

If ruddy and rotund young ladies pine for graceful slimness and romantic pallor, let them avoid vinegar and other acids destructive to health, and either accept, with a laughing grace, what nature has bestowed on them, or else practice a proper regimen and system of habits, to avoid what they so much dread. Take plenty of exercise, be less indolent, and more moderate in the quantity of sleep indulged in, as much sleep implies much inactivity, and leads to an accumulation of fluids in the body, and the consequent deposition of fat in habits predisposed to secretion. Those, on the other hand, who wish more obesity, we would advise to indulge in good feeding, composed of plenty of farinaceous food, with but little meat, and plenty of pure fresh water, and lead a calm life, free from mental inquietude.

A New Gold Excitement.

Since the days when the grandees of Old Spain looked upon the continent of America as a land of gold, and the love of wealth made them forget their family pride, and the time when Sir Walter Raleigh risked his life on the broad Atlantic to visit the western Eldorado—not in a steamship or a modern clipper ship—from these times to to-day this continent has been subject to the best kind of yellow jacks, namely, gold fevers. California has been made by one, and no sooner do we see her rising a prosperous State, and able as it were to walk alone, without the stimulus of gold washing, than a new field is opened up for the restless miner, and gold in plenty is discovered far north on the Pacific Coast. Thousands have left California for the new gold field, which is in the valley of the Frazer river, in the British possessions, flowing from the Rocky Mountains into the Gulf of Georgia. There would seem to be no humbug in the excitement, and the gold discovered has been really astonishing, many miners report having collected almost fabulous quantities of gold. The Hudson Bay Company have the control of this portion of the country, and we are inclined to think that the discovery of gold in their territory, and consequent enormous immigration, will do more to break up this disgraceful monopoly than all the Reports which the British House of Commons have been making for the same purpose during the last few years. The Indians who inhabit the district belong to the Chinook tribe, and are already familiar with the whites from their intercourse with British and French trappers, and will no doubt prove of valuable assistance to the miners. We also see that some English capitalists propose to make a great Pacific Railroad in connection with the Grand Trunk of Canada, and their surveyors are already in the field planning the line from Lake Superior through this same territory to Vancouver's Island in the Pacific Ocean. This will increase the value of the gold mines, and render the journey there easy. Imagine the *Great Eastern* to Portland, railroad to Montreal, crossing the Victoria Bridge, from thence by boat and rail to the Pacific—only seven thousand miles by steam—through the finest scenery in the world, and over the greatest engineering triumphs mankind has ever seen. Truly America and England are great countries, and the people *rather* go-a-head.

The Gibbs' Interference Case.

Among the patents issued on the 13th inst., we find that of James E. A. Gibbs, assignor to John H. Ruckman, being a re-issue of his patent dated June 2, 1857. The issue of this renewed patent terminates one of the most severely contested interference suits that has ever been tried in the United States Patent Office. A brief history of this case may prove not uninteresting to our readers. As above stated, Gibbs obtained letters patent for an improvement in sewing machines on the 2d day of June, 1857; and in September following, A. F. Johnson, assignor to himself and F. F. Emery, filed an application for a similar invention and demanded an interference. Upon examination of the evidence presented on both sides, priority was decided on the 6th day of March, 1858, in favor of Gibbs. Instead of appealing to the Circuit Court of the District of Columbia, the attorney for Johnson made a successful attempt to obtain a second trial within the Office, which, however, resulted in the dissolution of the interference, the Commissioner deciding that Johnson only claimed a peculiar construction of hook, consisting in a specified combination and arrangement of parts, which claim, he thought, might be allowed. Gibbs' assignee, not satisfied with this decision, insisted that the question of priority be decided. He accordingly caused the suspension of the issue of Johnson's patent, surrendered his patent, and applied for a re-issue of the same with a claim covering Johnson's modification. This having been examined in connection with the evidence before the Office, the Commissioner granted the patent to him, thus acknowledging Gibbs' priority and title to a broad claim. Both Johnson's and Gibbs' patents were ordered to issue simultaneously, but delays occurred in the issue of the latter on account of an error in the records of assignments.

Our Prophecy Fulfilled.

On page 333, of the present volume of the SCIENTIFIC AMERICAN, we expressed our views on the plan about to be adopted to disinfect the *Susquehanna*, and we entered our protest against removing her stores at this season of the year, prophesying disastrous consequences from such a very fool-hardy proceeding. Well, our *learned* Board of Health and *sapient* officers of Quarantine knew better, and despite of warning, continued their operations. The result will be seen in the following paragraph, copied from the New York *Tribune* of July 22d, under the head of "Quarantine Matters":—

"The United States ship *Susquehanna* appears to be situated about as badly as the *Grotto* (another infected ship). Cases of fever occur daily, and those on board, numbering about forty, are much alarmed, and ask to be relieved. Since Monday five men have been prostrated. Every effort will be made to free the vessel of the infection, though all past efforts have most signally failed."

This is exactly as we expected, and, of course, no one is to blame—the *mis*-governors of the city not being responsible for human life. What a fine thing it is to have a good salary and no responsibility!

The Dudley Observatory.

The unfortunate quarrel which has sprung up between the Director of the Dudley Observatory, Dr. Gould, and certain of the trustees, has called forth a pamphlet from the Scientific Council, Professors Henry, Bache, and Pierce, in which it is clearly and ably demonstrated that Dr. Gould has been most shamefully abused by a set of conceited individuals, who seem to have about as much knowledge of astronomy as a pig has of refinement. The pamphlet contains 90 pages, and is an interesting exposé of this ridiculous controversy.

The ninth exhibition of the Chicago Mechanics' Institute, for specimens of American manufactures, and the mechanic arts will be opened September 4th, this year, and continue open until the 17th of the same month. Space can be had by addressing G. P. Hunson, Superintendent.

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Steam Boilers and Furnaces.

ARTICLE 4.

The draft of furnaces is a question of great importance, and yet it is one to which too little attention has been devoted both by practical and scientific men. At present we can merely throw out a few useful hints on the subject. The utility of every furnace depends on its draft. A fire burns because the oxygen of the atmosphere is brought into contact with fuel at a high heat. A chemical union, called *combustion*, between the oxygen and the fuel is effected, and heat is developed. The combustion of fuel converts most of its solid constituents into carbonic acid gas and water; these products of the fire possess the property of extinguishing it, hence the necessity for carrying them off as fast as they are generated in the furnace, To carry on combustion the fuel has to be continually furnished with fresh air. The supplying of this air to a furnace, and the removal of the gases produced by combustion, constitute "the draft."

The efficiency of a boiler furnace, or any other kind, depends on the rapidity with which coal can be perfectly burned in it. By simply bringing the oxygen of the air into contact with fuel, rapid combustion cannot be effected. A fire built in an open space under a boiler burns very slowly, because the heated gases, in expanding, meet with much resistance owing to the great expanse of the superincumbent atmospheric column; such a fire is said to have *no draft*. But when the fire is enclosed in a furnace, and the heated gases of combustion are conducted away in a contracted unbroken column through a chimney, the fire burns rapidly—it has a good draft. The reason of this is the heated ascending gases in this case meet with but a limited resistance in comparison with those of the open fire, because they have a much less superincumbent weight of air to displace.

The deductions of science show that the draft of a furnace is increased according as a chimney is elevated, because the pressure of the atmosphere is less at its top than base. Many mistakes have been committed in building short wide chimneys, thinking thereby to obtain a rapid draft, but few mistakes have been committed in building high chimneys. On this point—the hight of chimneys—there is no difference of opinion among those who are versed on the subject, but there is in regard to the proper area of chimneys. Some contend that a chimney of a limited hight does not require to be wider than the aggregate section of all the flues or tubes of the boiler. Others contend that the area of a chimney should be twice that of the flues, and Mr. John Curry, an engineer, of Louisville, Ky., who has constructed the engines and boilers of many western steamboats, considers that the area of steamboat chimneys should be two and a half times that of the flues, independent of the area of fire grate. Mr. Curry's testimony on the draft of the furnaces of western steamboats, given in the great trial against the Wheeling Bridge Company in 1850, amounts to this, that with these proportions of chimney area to that of the flues, a good natural draft can be obtained in chimneys from 30 to 50 feet high. Mr. Scott Russell, on the other hand, gives the rule that for each square foot of fire grate the flues should be one-fifth, and the areas of chimneys only one-tenth, and of equal diameter throughout. "If the chimney," he says, "is forty feet high, and has a cross section of one-tenth of the area of the fire grate, it will give an abundant draft. Some very satisfactory boilers have been made by allowing a proportion of 0.6 of a square foot of fire grate per nominal horse power, and making the sectional area of the flue at the largest part one-seventh of the area of grate, and at the smallest part (back end) one-eleventh area, and chimneys the same."

So also says Bourne, allowing in such cases sixteen square feet of flue or tube heating surface for each horse power. A better draft has been obtained with boilers twenty-eight feet long on steamboats than with those of greater length. Short wide boilers with vertical tubing afford the best draft, and are the most efficient in evaporation. The higher the heat in a furnace, of course, the more rapid is the draft. Furnaces well lined with fire brick are more efficient than those which are surrounded with iron sides, even when such sides have water spaces behind them. It is common in furnaces to allow one-third of the area of the grate bars for open spaces, to admit the air to pass into the furnace, but in some instances equal areas of air spaces and fire bars are used. As no more air can pass into a furnace to supply combustion than that which passes between the grate bars, it would be reasonable to suppose that at least an equal area of space should be allowed for the flues and chimney. Some contend that such are the best proportions, but this is a subject regarding which practical and scientific men have no generally settled opinions. It would be well if an extensive set of judicious experiments were made to ascertain the best proportions of the draft spaces in furnaces of all kinds. It has been found that a chimney of fifty feet in hight gives a good draft for small boilers from up to 20 horse power. A chimney one hundred feet in hight is sufficient for the draft of engine boilers from 50 up to 400 horse power. A rapid draft can be obtained in any chimney, however short, by a blower, the steam blast exhausting into the chimney.

At present, we conclude these articles, but at some future time may recur to the subject.

Californian Research.

MESSRS. EDITORS.—Owing to the extreme state of isolation in which we exist, having communication with Upper California and the civilized world only at intervals of four or five months, I have just received my last batch of your journal since the 1st of December last. In the number for December 26th you give an abstract of the result of Dr. Hayes' experiments and observations on the conversion of uncrystallizable sugar(glucose and fungin with melissic acid) into cane sugar, and state "the chemical change referred to Dr. Hayes pronounces to be something entirely new." This fact I discovered in the summer of 1856, in the course of a series of experiments on the generation of the alkaloid daturin; and the facts were announced in the California press, and thence copied into several European journals. These results were subjected to revision, and confirmation received of their correctness, in investigations instituted into the nature of the sugars of different varieties of datura and staphelia, the pomegranate, and various indigenous plants of the Peninsula, in the months of November and December last. The saccharine secretions on concentration yielded in some instances a few concretions of irregular tabular crystals of glucose, in others a gummy uncrystallizable mass, polarized strongly to the left, and precipitated gold, silver and copper from their solution in the metallic state without the aid of heat. After an exposure of a fortnight to atmospheric action I found the sirup filled with a mass of crystals, which appeared under the magnifier oblique rhombic prisms; the solution precipitated nitrate of silver but slowly, and *polarized strongly to the right*. This change has, in the intervening period, affected more than 95 per cent of the original substance.

I must not occupy your space in detailing the minutiæ of the experiments, but will add that the direct solar radiation greatly facilitates the conversion; that the change proceeds very slowly, or not at all, in hermetically-closed vessels; and that I have hitherto obtained no clue to the cause of the phenomenon. R. L. D'AUMAILE.

La Paz, Baja California, May, 1858.

[Although the remarks made by our correspondent are on a subject the discussion of which we have for some time avoided, we insert them, because they show that even in our western wilds there are persons who study science and obtain results as accurate and as valuable as any that are promulgated from our colleges of the north.—EDS.

The Atlantic Cable Failed.

The steamship *North Star*, from Southampton, arriving at this port July 20, brought news of the failure of the enterprise. The *Niagara* and *Gorgon* arrived at Queenstown, Ireland, on the 5th, and the *Agamemnon* and *Valorous* had not arrived on the 7th. The two larger ships met on the 28th of June, and for the third time connected the cable; they then started afresh, and the *Niagara* having paid out over one hundred and fifty miles of cable, all on board entertained the most sanguine hopes of success, when the announcement was made on the 29th at 9 P. M., that the electric current had ceased to flow.

As the necessity of abandoning the project for the present was now only too manifest, it was considered that the opportunity might as well be availed of to test the strength of the cable. Accordingly, this immense vessel, with all her stores, &c., was allowed to swing to the cable, and in addition, a strain of four tuns was placed upon the breaks, yet, although it was blowing fresh at the time, the cable held her as if she had been at anchor, for over an hour, when a heavy pitch of the sea snapped the rope, and the *Niagara* bore away for Queenstown. She must have passed the *Agamemnon*, but owing to the heavy fogs missed seeing or gaining any tidings of her. It was conjectured that the latter may have returned to the place of meeting.

Should nothing be heard of her, the *Niagara* would, after coaling, proceed to the ocean station. Having still on board 1800 miles of the cable, which, supposing the other vessel has retained a similar amount, would still permit the junction being completed, and allow 30 per cent for casualties.

These repeated failures have taught us something. Professor Morse, thinking from the results that the cable is too thick, and many others that it is too thin; the Professor's view is, however of the greatest value, and should be tested by a practical experiment. The *Evening Post*, of this city, in an able article on this subject, concludes with the following axioms, which every one having common sense must indorse:—

"A cable *coiled* cannot be uncoiled without *kinks:*

"Therefore the cable must be *reeled* to be laid.

"The necessity of two vessels to lay the cable, quadruples (and more) the risk of accidents:

"Therefore the cable must be laid from *one* ship.

"The voyage *to* England is easier, shorter and safer than the voyage *from* England:

"Therefore the vessel with the cable should start from this side.

"There is one vessel, and one only, of tunnage and room sufficient to carry the whole cable, to wit—the *Great Eastern:*

"Therefore, the cable, if ever laid at all, must be stowed on a succession of reels in the *Great Eastern*, and that ship must sail from our own shores."

If these views should be deemed to possess any value, it would be easy for the *Great Eastern* to bring the cable with her to this country and lay it on her first trip home. While acknowledging the numerous difficulties in the way, we cannot be persuaded to despair, because we know that ultimately the cable must and *will* be laid.

Since the above was written, the following intelligence was received in this city:—

WASHINGTON, July 24, 1858.

Captain Hudson, in a letter to the Navy Department, dated Queenstown, July 8th, says that the *Niagara* was then awaiting the arrival of the *Agamemnon* and *Valorous*, when he hoped to start again for the rendezvous in seven or eight days, under more favorable auspices of weather than experienced in June.

The Upas Tree.

An exchange says the story that the Upas tree of Java exhales a poisonous aroma, the breathing of which causes death, is now known to be false. The tree itself secretes a juice which is deadly poison, but its aroma or odor is harmless. Strychnine is made from the seeds of a specie of Upas tree. Such is the name of a district the atmosphere of which produces death. This effect is not occasioned by the Upas tree, but by an extinct volcano near Batar, called Guava Upas. From the old crater and the adjoining valley is exhaled carbonic gas, such as often extinguishes life in this country in old wells and foul places. This deadly atmosphere kills everything that comes within its range—birds, beasts and even men—and the valley is covered with skeletons. By a confusion of names, the poisonous effects of this deadly valley have been ascribed to the Upas tree, the juice of which is poisonous, and hence the fable in regard to the deadly Bohun Upas tree.

Death of M. Gardissal.

We are pained to learn the death of our able and faithful Paris correspondent and agent, M. Gardissal. Through this event the business heretofore so ably conducted by the deceased will be carried on by his equally able sons, C. Desnos and F. Gardissal, who have for many years past acted as assistants to their father, and who will continue to act as our attorneys and agents at Paris.

M. Gardissal, during a long and active life, contributed much to the advancement of science and the mechanic arts by his numerous writings on industrial education, legislation, and development. After a vigorous application in early youth to fit himself for the profession of a mechanician and civil engineer, and acting as Professor in the University, he devoted his life to the zealous discharge of his duties with a warm attachment to the cause in which he had embarked. In 1854, M. Gardissal published a dictionary of technical terms in French and English, and for some years past published a monthly periodical (*L'Invention*), to which and other works he contributed much valuable matter, in which was displayed great spirit of research, indefatigable industry, and liberal and manly sentiments. M. Gardissal was endeared to many of our clients and other Americans, who received, upon their visits to Paris, the most marked evidences of his attention and kind disposition, and who will learn the announcement of his death, as we have, with the most profound sorrow.

A Suggestion to Cities.

The people of this country profess to be profound admirers of water, and we boast with honest pride of our Croton and Fairmount; yet no sooner are water works introduced into a city than the pump and accompanying cup are removed, and the weary foot passenger is actually driven into a bar-room or soda water saloon to quench his thirst. We would suggest that for every cup and pump removed from the public streets, a little stream of the pipe water be substituted, either in the form of a fountain on the curb-stone, or as an ornament to an alcove in the wall of some house or public building. These might be made very ornamental, and a ladle or cup attached would do more to promote the temperance of our population than the employment of a dozen lecturers on the subject. The expense would be very trifling, and the boon would be thoroughly appreciated by every one. The cities of Europe are nearly all provided with little fountains, at which the people can drink; and as we have copied them in the beautiful and healthy custom of planting our streets with trees, let us also copy them in supplying limpid streams of cooling water.

A Gentle Hint.

We are constantly being asked by correspondents for advice which is of a strictly personal character, such as the relative merit of certain machine shops, whether the writer is qualified for this profession or that profession, to all of which we must decline answers, not because we have no desire to advise our friends, but because the SCIENTIFIC AMERICAN is for the *public* good, and for the spread of generally interesting facts and useful knowledge.

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Correspondents

P. & T., of N. C.—We are of opinion that lightning rods should not be insulated from metallic or other roofs. If the rods are in one piece we do not think that paint destroys their efficiency. If made in sections, the paint, by becoming interposed between the joints, may produce insulation or separation sufficient to cause danger

E. C. H., of N. H.—We shall be happy to hear the result of your experiments on hen's eggs, although we cannot see why eggs laid in August should be better than those laid in any other month.

J. H. B., of Ill.—A good waterproof cement is made by dissolving india rubber in coal tar or naphtha. Soda biscuits are made by substituting carbonate of soda for yeast.

A. B. K., of C. W.—Type metal, consisting of 6 parts of lead and 2 of antimony, or Britannia metal, which is composed of variable quantities of copper, tin, bismuth, and antimony, would answer your purpose and take plating well.

J. W., of N. Y.—When the atmosphere is not fully charged with electricity, or in other words, when the air and earth are not equalized in the quantity of electricity, it is not in its normal condition, and so will not conduct sound as well as when it is properly charged. But an over-dose of electricity in the atmosphere would be as likely to interfere with its sound-conducting properties as an under-dose. We do not know of any work treating on this subject; such a book would prove very interesting.

G. W. C., of N. Y.—Haswell is perfectly correct in stating that "the centrifugal force of a body making ten revolutions a minute is four times as great as when making five revolutions a minute;" but you are wrong in supposing that it only requires twice the power to double the speed, for it takes four times the power to double the speed, so that there is no excess that can be made available.

J. A. L., of Ga.—We expect that the reason your chimney gets red hot is, that it is too near the furnace, and your exhaust may enter the chimney at too high a point, so that it condenses, and the air being very rarified indeed where the chimney is hot, the condensed exhaust steam falls down, cools it, and so produces a downward, instead of an upward draft, for a short time. As we do not know all the conditions and relations of your boiler, furnace, engine, and chimney, this is the best theory we can give you.

J., of D. C.—The reason why the snake-like motion is observed in a rope that is agitated in one end, is that the material is elastic, and as you disturb the line by moving to one side, there must be a compensating departure from the line on the other, and this being continued, the wavy motion is produced, namely, by alternate compensations, the force applied being quicker than the conducting power of the rope.

A. B., of Mass.—Evaporated water contains no solid matter, saline air being produced by the air entangling in solid particles of salt which have been left by the evaporation of sea water. It is a purely mechanical mixture.

W. S., of Ind.—You had better refer to "The Ambrotype," by Charles Seely, published by Seely & Garbanati, 424 Broadway, New York.

J. T. M., of N. Y.—The simplest method we can recommend you for preserving eggs, is to dip them in grease, and then pack away in oats, or similar material. You will find plenty of receipts in back volumes of the Sci. Am.

J. W., of Mich.—A good elementary work is "Colburn on the Locomotive," published by Wiley & Halstead of this city. The link-motion is very old—we think George Stephenson is the inventor.

C. C. H., of Ill.—A body falls with exactly the same velocity, in the inverse ratio, that it ascends, deducting the difference of atmospheric resistance. The law which governs falling bodies is; that the velocity increases in arithmetical progression, following the odd numbers; thus a body falling sixteen feet the first second, will fall three times sixteen feet the next second, five times sixteen the third second, and so on.

D. McG., of Texas.—M. & J. H. Buck & Co., of Lebanon, N. H., can furnish you with a brick machine adapted for your purpose. See engraving on page 265, Vol. XI, Sci. Am.

J. A., of Pa.—If you have a patent on your machine here, a party has no right to make the machine, even if he does ship it to another country to be used. Your patent protects you in the sole right to make, sell, use, &c., and a party violating either of these conditions is liable to you for infringement.

W. D. B., of Mo.—We only stated, on the authority of many millers, that water exerts more power at night than in the daytime, and that furnaces draw better at night. We should really like the results of some practical experiments on the subject.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, July 24, 1858:—

J. R. F., of Ohio, $25; J. C. McD., of Ohio, $60; J. W. C., of Ind., $30; G. M. P., of Mass., $55; S. H., of N. H., $25; F. & B., of Wis., $25; E. D., of La., $30; I. P. E., of Ind., $35; J. H. R., of Ill., $25, E. L., of Conn., $30; F. McN., of Ohio, $25; J. B., of Ill., $30; W. B., of N. J., $35; S. N. S., of N. Y., $35: J. W., of N. Y., $25; W. P., of Del., $30; A. W. D., of Me., $30; H. & M., of Pa., $10; J. C. DeW., of N. J., $30; J. L., of Mass., $10; C. P. G., of Ill., $55; P. & D., of N. Y., $25; B. S. M., of Iowa, $30; A. R., of N. Y., $29; W. M. S., of ——, $30; W. T. F., of Tenn., $25; J. A., of Pa., $30; J. D., of N. Y., $27; W. D. A., of N. Y., $55; J. R., of N. Y., $57: W. D., of N. J., $16; B. & R., of Ill., $25; J. A. B., of Ga., $100; W. W. St. C., of Va., $27; J. H. B., of N. Y., $35; W. D., of N. J., $14; H. G., of Ill., $30; J. A. K., of Mo., $55; A. S., of N. Y., $25; M. A. W., of Ohio, $40; J. K., of N. Y., $30; J. A., of S. C., $50; J. J., of N. Y., $20; G. M., of Conn., $110; R. W., of Vt., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, July 24, 1858:—

H. & M., of Pa.; J. C. C., of N. Y.; G. W. B., of N. Y.; J. J., of N. Y.; J. H. R., of Ill.; W. B., of N. J.; G. M., of Conn.; J. A. T., of Ohio; N. T. S., of Mass.; J. D., of N. Y.; F. B. A., of Iowa; P. & D., of N. Y.; A. S., of N. Y.; W. D. A., of N. Y.; J. W., of N. Y.; G. M., of Conn.; B. & R., of Ill.; S. H., of N. H.; E. D., of La.; F. McN., of Ohio; A. R., of N. Y.; S. N. S., of N. Y.; R. W., of Vt.

Literary Notices.

Signers of the Declaration of Independence.—We have received a copy of a large and handsomely executed chart, containing a history of all the signers of the immortal Declaration. It gives in a brief form the birth place, residence, profession, age, number of children, place of decease, &c. This is a highly useful and valuable work. It reflects much credit on the author, J. C. Power, of Peoria, Ill. To be had of Duval, lithographers, Philadelphi, or I. S. Clough, 231 Pearl street, New York.

"The Country Gentleman entered upon a new volume on the 1st inst. This is a 'Gentleman' that may be taken to your fireside, your parlor or your library with safety. The more familiar and intimate your acquaintance, the more your pleasure and your profit. We will guarantee its character as above reproach or suspicion. It is one of the very best of our agricultural and family papers."

The above paragraph from the New York Observer receives our hearty endorsement.

The California Culturist—Wheeler & Wadsworth, publishers, San Francisco.—We have received the first number of this new periodical devoted to agriculture in California, and the study of nature everywhere. There are many such publications in the older States, but for typography, matter and general appearance, this equals any one of them, and it is in every way a credit to the Golden State.

The Scalpel.—E. H. Dixon, M. D., Editor, and published by Sherman & Co., No. 1 Vesey street, New York.—This valuable publication, which has an honest abhorrence of humbug, whether professional or not, is the ablest journal of its kind this side the Atlantic, or rather we should not say "of its kind," for it is distinctive and stands alone an open, honest oasis in a broad desert of medical quackery, interesting as a romance, and truthful as history.

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Patent Claims—Persons desiring the claim of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and date of patent when known, and enclosing $1 as fee for copying.

TERMS OF ADVERTISING.

Twenty-five cents per line each insertion. We respectfully request that our patrons will make their advertisements as short as possible. Engravings cannot be admitted into the advertising columns.

*** All advertisements must be paid for before inserting.

IMPORTANT TO INVENTORS.

American and Foreign Patent Solicitors.—Messrs. MUNN & CO., Proprietors of the Scientific American, continue to procure patents for inventors in the United States and all foreign countries on the most liberal terms. Our experience is of twelve years' standing, and our facilities are unequaled by any other agency in the world. The long experience we have had in preparing specifications and drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between nine and four o'clock, daily, at their principal office, 128 Fulton street, New York. We have lately established a Branch Agency on the corner of F. and Seventh streets, Washington (opposite the United States Patent Office). This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard St Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European patents secured to American citizens are procured through our Agency.

Circulars of information concerning the proper course to be pursued in obtaining patents through our Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the principal office or either of the branches.

Communications and remittances should be addressed to MUNN & COMPANY,
No. 128 Fulton street, New York.

The annexed letter from the late Commissioner of Patents we commend to the perusal of all persons interested in obtaining patents:—

Messrs. Munn & Co.—I take pleasure in stating that while I held the office of Commissioner of Patents, more than one-fourth of all the business of the office came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers.

Yours, very truly, CHAS. MASON.

Steam Whistles—Improved patterns for locomotive and stationary engines. A large assortment constantly on hand. Manufactured by HAYDEN, SANDERS & CO.,
306 Pearl st., New York.

The subscriber has established the manufacture of his Self-straining Saw Mill Irons, at Chicago, Ill. Letters addressed to him at Chicago for the next three weeks will receive personal and prompt attention, if accompanied with a stamp.
July 6, 1858. S. E. PARSONS.

Harrison's 20 and 30 inch grain Mills constantly on hand. Address New Haven Manufacturing Co., New Haven, Conn.

For sale—an 8-horse upright Engine, Boiler, and fixtures, second-hand (nearly new), all in good running order. Address H. B. MATHER, West Norwalk, Conn.

5,000 agents wanted—to sell four new inventions. Agents have made over $25,000 on one. Better than all other similar agencies. Send four stamps and get eighty pages particulars, gratis. EPHRAIM BROWN,
Lowell, Mass.

Woodworth planers—iron frames to plane 18 to 24 inches wide—at $90 to $110. For sale by S. C. HILLS, 12 Platt street New York.

Iron planers and engine lathes of all sizes, also Hand Lathes, Drills, Bolt Cutters, Gear Cutters, Chucks, &c., on hand and finishing. These tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, address "New Haven Manufacturing Co., New Haven, Conn."

S. D. Barnett, malleable and grey Iron Foundry, Hamilton, corner of McWhorter st. Newark, N. J. Orders promptly attended to.

Second-hand machinists' tools—Viz., Engine and Hand Lathes, Iron Planers, Drills, Chuck Lathe, Gear Cutter and Vises, all in good order, and for sale low for cash. Also one new first-class Woodworth Planing and Matching Machine. Address FRANKLIN SKINNER, Agent, 14 Whitney avenue, New Haven, Conn.

The "Country Gentleman"—the best of the agricultural or horticultural papers for any latitude or locality is published weekly, each number containing sixteen large quarto closely printed pages, at the low price of $2 a year, by
LUTHER TUCKER & SON,
Albany, N. Y.
N. B.—A new volume begins July 1st. Send for a specimen number.

Important to iron and brass founders—After a series of experiments I have invented a method of constructing molds for iron, brass or other metals, which can only be cast at a high heat, of cheap material, easily obtained in any section, and as easily worked or constructed as any ordinary mold of sand. Many thousand casts may be made from these molds without any risk of injury, if properly managed; they are not likely to blow, or get out of order. They can be worked with great rapidity (once every 2 minutes if necessary), which fact renders them very valuable to malleable iron workers. My charge for the recipe, with full directions, is $10, accompanied by an obligation from the applicant to entire secrecy. A liberal discount will be made to those wishing to buy exclusive territory—States or towns. Letters Patent will be applied for. Address,
W. HUDGIN, Practical Chemist,
Bowling Green, Va.

Eccentric screw and gripping wrench—Hyde's patent—for sale by all hardware stores. Proprietors, GRAY BROTHERS, New York City.

Slide lathes, iron planers, up right Drills, Slotting and Boring Machines, Universal Chucks, and a large assortment of machinists' tools, at greatly reduced prices. Address CHARLES H. SMITH, 135 North Third st., Philadelphia, Pa.

Maryland Institute, Baltimore, —The Managers of this Institute, encouraged by the success of former efforts, announce, with confidence of continued success, their Eleventh Annual Exhibition, to be opened in the Institute's spacious building on the 5th of October, and continue open four weeks. From the 27th to the 30th of September, inclusive, articles will be received for competition and premium, afterwards for exhibition only. Persons from all parts of the Union are invited to contribute. Aside from the general advantages of this Institute for the exhibition of products of the skill and industry of their countrymen, the Managers submit that the present is an opportunity which none should allow to pass unimproved. As business is now rallying from its unparallaled depression, he who, by a judicious exhibition of his ability to meet the demands of that revival, and secure the attention and confidence of the community, insures success, and paves the way to competence and fortune. Circulars with rules, &c., will be promptly furnished on application to JOHN S. SELBY, Actuary.
D. L. BARTLETT, Chairman.

Braden's burglar-proof lock—Adapted for safes, doors, &c. For description see No. 47, Vol. XIII, Sci. Am. State or county rights for sale. Address J. A. BRADEN, La Grange, Ga.

Pusey's horse power governor—See cut in No. 45, Vol. XIII, Sci. Am. Shop rights for sale, to build in combination with the powers. Independent governors manufactured exclusively, and for sale by the patentee, LEA PUSEY, near Wilmington, Del. Agents wanted.

Wellington mills emery—consumers will look for copyright label on each cask, by whomsoever sold, and they will be sure of the best emery. Casks contain 200 pounds each. Testimonials of its superiority from Collins' Axe Co., and many others. GEO. H. GRAY & DANFORTH,
Boston, Mass.

Lath mill—J. H. Bachelder's patent. State and County rights for sale. For description see Sci. Am., Vol. 13, No. 29. Address
SAMUEL COMBS,
Hudson, Mich.

Harrison's grist mills—20, 30, 36 and 48 inches diameter, at $100, $200, $300 and $400, with all the modern improvements. Also, Portable and Stationary Steam Engines of all sizes, suitable for said Mills. Also, Bolters, Elevators, Belting, &c., &c. Apply to S. C. HILLS, 12 Platt st., New York.

C. Y. Heckler, No. 624 Market st., Philadelphia, wishes to obtain several of the best washing machines that can be procured.

Steam engines, steam boilers, Steam Pumps, Saw and Grist Mills, Marble Mills, Rice Mills, Quartz Mills for gold quartz, Sugar Mills, Water Wheels, Shafting and Pulleys. The largest assortment of the above in the country, kept constantly on hand by WM. BURDON, 102 Front street, Brooklyn, N. Y.

The works of the Aubin Gas Co., (General Office, No. 44 State st., Albany, N. Y.,) as now perfected, are adapted to all materials and localities, and are in successful operation in villages, factories, and private dwellings. For full information as to cost, probable income of public works, &c., apply as above. For plans, &c., see Scientific American of March 13th.

Machine belting, steam packing, engine hose.—The superiority of these articles, manufactured of vulcanized rubber, is established. Every belt will be warranted superior to leather, at one-third less price. The Steam Packing is made in every variety, and warranted to stand 300 degs. of heat. The hose never needs oiling, and is warranted to stand any required pressure; together with all varieties of rubber adapted to mechanical purposes. Directions, prices, &c., can be obtained by mail or otherwise, at our warehouse. NEW YORK BELTING AND PACKING COMPANY. JOHN H. CHEEVER, Treasurer, No. 6 Dey street, New York.

These machines have no rival.—[Scientific American.

Wheeler & Wilson's sewing machines, 343 Broadway, New York, received the highest premiums awarded in 1857 by the American Institute, New York; Maryland Institute, Baltimore; and at the Maine, Connecticut, Illinois, and Michigan State Fairs. Send for a circular containing editorial and scientific opinions, testimonials from persons of the highest social position, &c.

Lap-welded iron boiler tubes—Prosser's Patent.—Every article necessary to drill the tube-plates and set the tubes in the best manner.
THOS. PROSSER & SON, 28 Platt st., New York.

Andrews' centrifugal force and Suction Pumps—Illustrated in Sci. Am., October 24, 1857. Sizes, from 60 to 4,000 gallons per minute. Larger sizes made to order. Pump, sand, gravel, coal, paper pulp, &c., and for simplicity, durability, and economy of power, are superior to any pump made.
WILLIAM D. ANDREWS,
No. 414 Water st., New York.

Philadelphia rivet works—manufacturers of the celebrated P brand. Boiler, tank, and gasometer rivets, of every diameter, length, and head. PHILLIPS & ALLEN.

Clark's regulator—from ten to twenty-five per cent saving in fuel is guaranteed in the use of Clark's Patent Steam and Fire Regulators; besides giving the most perfect regularity of power at any desired pressure, and no fear of explosions. Send for circular at 229 Broadway, New York City.
E. R. PRATT, Secretary.

Belting and packing—Niagara Falls Paper Manufacturing Co., Niagara Falls, April 20, 1858. United States Gutta Percha Co.: We duly received the Gutta Percha Belting ordered from you, and after giving it a thorough test the past winter, on our heaviest engines, constantly exposed to water, ice and oil, and making 140 to 160 revolutions per minute; and again on two of our largest "Gwynne Pumps," making from 600 to 700 revolutions per minute, they have given us entire satisfaction, and we think it decidedly the best belting we ever used, and you may look for our future orders as required. S. PETTIBONE,
Treasurer and Superintendent.
For sale by the UNITED STATES VULCANIZED GUTTA PERCHA CO., No. 66 Liberty street, New York.

New Orleans—VOSE & WEST, Commission Merchants for the sale of Machinery, Agricultural Implements, &c., New Orleans. Refer to W. P. Converse & Co., 42 Pine street, New York.

Engraving on wood and mechanical drawing, by RICHARD TEN EYCK, Jr., 128 Fulton street, New York, Engraver to the Scientific American.

Every millwright, all mill-owners, and those interested in hydrodynamics, should become acquainted with the merits and principles of the improved Fourneyron Turbine Water Wheel, or the "Universal Turbine," a wheel the most economical in the use of water, and giving the highest percentage, with a partially raised gate, of any yet discovered. It gives from 75 to 97 per cent of power, according to the size of wheel and head employed. For information address S. K. BALDWIN,
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N. B.—For low falls of one, two, or three feet, also for any fall, it will surpass all others.

Oil! oil! oil!—for railroads, steamers, and for machinery and burning. Pease's Improved Machinery and Burning Oil will save fifty per cent., and will not gum. This oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough and practical test. Our most skillful engineers and machinists pronounce it superior and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The Scientific American, after several tests, pronounced it "superior to any other they have ever used for machinery." For sale only by the inventor and manufacturer, F. S. PEASE, 61 Main st., Buffalo, N. Y.
N. B.—Reliable orders filled for any part of the United States and Europe.

Vail's speedwell iron works, Morristown, N. J., manufacture Craig's Patent Double-acting Balance Valve Oscillating Steam Engines both stationary and portable, Knowles' Patent Muley, Portable, Gang and Re-sawing Mills, Sugar and Chinese Cane Mills and Sugar Pans, Grist Mills, Mill Irons, Rich's Water-wheels, Forgings and Castings. Orders for the above, and all descriptions of labor-saving machinery will receive prompt attention.
JOHN H. LIDGERWOOD & CO.,
No. 9 Gold street, New York.

Corliss' patent steam engines—About 250, most of them from 40 to 400 horse power, are now in operation. On application, pamphlets will be sent (by mail), containing statements of responsible manufacturing companies where these engines have been furnished, for the saving of fuel, in periods varying from 2¼ to 5 years. Boilers, shafting, and gearing.
CORLISS STEAM ENGINE CO.,
Providence, R. I.

Patent office models carefully made on scientific principles, at low prices, by H. SHLARBAUM & CO., 300 Broadway, New York. References at the office of this paper.

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Science and Art.

A Celestial Phenomenon.

At about eight o'clock on the evening of the 3d of July, says the Utica *Herald*, during a perfect deluge of rain, there occurred near Utica one of the most beautiful celestial phenomena ever witnessed in this country. The heavens were completely overcast with clouds, yet from the horizon to the zenith there appeared one expansive sheet of pink, of the most delicate and splendid tint. The hue was deeper in some parts than in others, yet it extended over the whole visible heavens, and was of so brilliant a character that by its reflection the water running through the gutters looked like streams of blood. Heaven's artillery had celebrated the glorious Fourth during pretty much the whole day, and in this phenomenon fireworks were displayed far beyond the skill of the most ingenious and accomplished pyrotechnist.

Strength of Wire Ropes.

We learn from a foreign exchange that a series of experiments were recently made at the Woolwich dockyard, England, to test the comparative strength of wire ropes manufactured by Messrs. Binks & Stephenson, under a new patent, and those made under an old one. The new ropes were made of the patent wire invented and manufactured by Webster & Horsfall, Birmingham, which is unquestionably the most remarkable yet produced, the weight which a very small sized coil will bear being almost incredible. The breaking strain, under the old patent and under the new, may be best judged by the comparison made. Thus, an inch and a quarter rope, made under the old patent, broke under a weight of 2 tuns 5 cwt., while under the new, to break the same thickness, it required no less than 4 tuns 19 cwt. A weight of 4 tuns 6 cwt. broke a rope of two inches diameter, made under the old patent, while it required 9 tuns 10 cwt. to break one of the same size under the new patent. The British Board of Admiralty have the matter under consideration, with a view to its application to the rigging of the ships of the royal navy. It may not be generally known, but it is none the less a fact, that a portion of several miles' length of the Atlantic cable (where it is supposed the greatest strain will be exerted) is made of this very wire of Webster & Horsfall. The wonderful superiority in point of tenacity of this patent iron wire may be judged from the fact that a single strand of No. 9 (about the thickness of about one eighth of an inch) will bear 3,360 pounds before snapping, whilst the same sized strand, made of the "best charcoal iron" snaps at 1,250 pounds weight.

We understand that there is an agent of Messrs. Webster & Horsfall in New York, who is about making an arrangement for the introduction of the wire rope of these manufacturers into this country.

New Bridge.

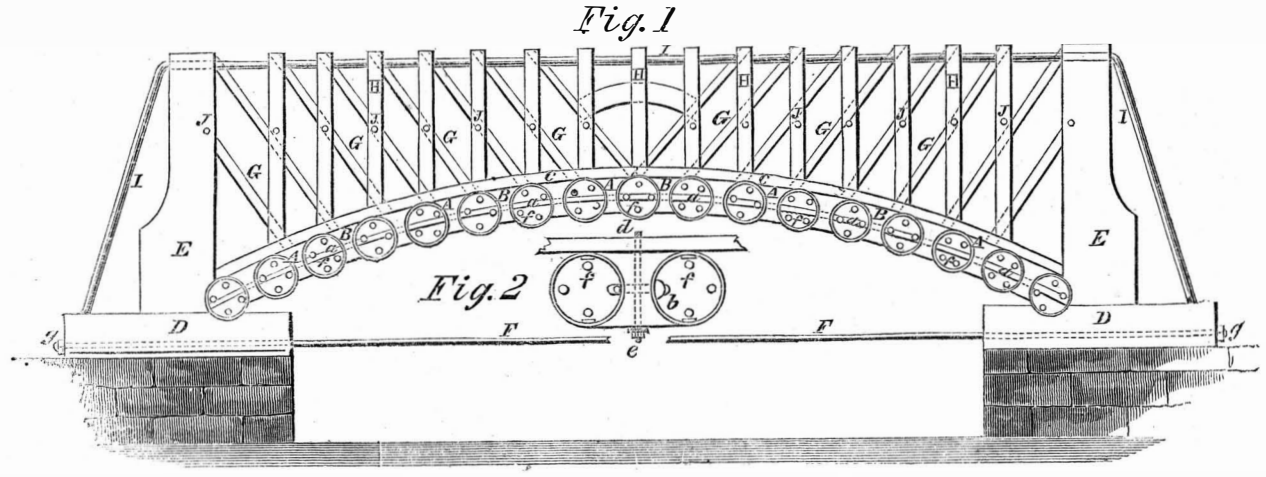
This bridge is constructed in an entirely novel manner, and in an eminent degree possesses the advantages of strength and lightness, together with simplicity of construction. It is a fact too well known to need any demonstration that the circle and triangle are the two most stable forms of disposing material for economy and durability, and in this invention both these forms are very prevalent.

The arch is composed of a series of tubes, A, made of wrought iron plates riveted together, or cast iron. These tubes are as long as the desired width of the bridge, and they are arranged side by side as seen in Fig. 1, their length being at right angles with the roadway of the bridge. B are blocks of wood or metal, but preferably of wood, fitted between the tubes at or near the ends thereof, and secured in place by long bolts, *a a*, passing through the whole series of tubes and blocks, and secured by nuts or keys at the ends, or by short bolts, *b*, Fig. 2, passing through a block and the adjacent sides of two tubes, and secured by a head on one end of the bolt, and a key on the other, or two nuts or two keys. In addition to the two series of blocks, B, there may be any number of blocks at intervals along the whole length of the tubes, so as to give the arch more rigidity. C is an arched timber or iron binder fitting over the tubes, A, and secured to the block by stirrup bolts, *d d*, plates, *e*, to keep them in position, and to retain the curve of the arch. The tubes, A, may be strengthened at the points where they are clamped between the blocks, B, by cores or disks, *f*, which may be fitted and keyed or cast on them.

D D are sills at each end of the bridge, and E E are stout upright posts tenoned and secured into the said sills. The ends of the arch of tubes rest in the angle between D and E, and the ends of C are tenoned into the posts. F F are tension rods of wrought iron connecting the sills, D D, and extended by nuts, *g*, at the ends, so as to confine the sills longitudinally for the purpose of counteracting any thrust on the ends of the arch. H H are upright posts tenoned into the arched timbers, C. G G are diagonal braces notched and bolted at their lower ends to the arched timbers, and at their upper ends to the upper part of the posts, H H, and also notched and bolted to such of the posts as they pass. F are wrought iron tension rods passing through all the posts H and E, and down to the sills, D, to which they are secured by nuts or keys. J are the roadway-bearers which may be of wood or iron, having bearings at their ends in the posts.

DURDEN'S IMPROVED BRIDGE.

Fig. 1



The most important feature in this bridge is the construction of the arch of the iron tubes, the interposed blocks and arched timbers or binders. It is the arch thus constructed which constitutes the entire support of the load; the duties of the other post being to keep the arch in shape, and to transmit to it the weight of a load passing over the bridge. The tension rods, F F, combine with the sills, D, and posts, E, to prevent the depression and longitudinal extension of the arch, and the posts, and braces, G, combine to prevent the rising of the bridge, and distribute the weight of a load from any point to the whole bridge.

Thos. Durden, of Montgomery, Ala., is the inventor, and he will be happy to furnish additional particulars upon being addressed as above. The patent is dated June 1, 1858.

Thayer's Carpet Fastener.

Much trouble is experienced by housekeepers in attaching the carpets to the floor, and to obviate the difficulty attending the getting up and putting down of them without tearing the carpet or injuring the floor by tacks, this inventor—Horace Thayer, No. 18 Beekman street, New York—has devised the carpet fastener that is the subject of our illustrations.

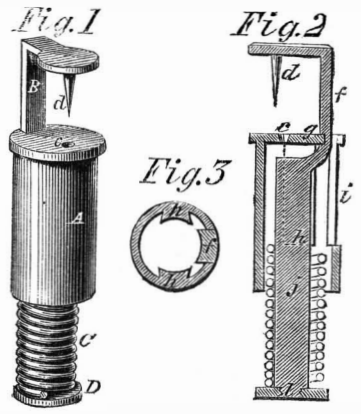


Fig. 1 is a perspective view, Fig. 2 is a vertical section, and Fig. 3 an horizontal section of the device.

A is the tube, with a cap at its upper end, to prevent it from sinking too deep into the floor, the top of which should be flush with the floor, and B is the slide in an elevated position, bent at right angles over A, and provided with a spike, *d*, that passes through the carpet and into a hole, *c*, in the top of the cap, A. The shank of B is somewhat less than the interior diameter of A, so that a spring, C, can pass between them, pressing against a projection, D, into which B is screwed at *l*. B is flattened out at *f*, so that it can pass down the slot, *i*, in the case, A. The spring rests on two shoulders, *h h*.

The operation is as follows:—The case being let in the floor, the shank, B, is elevated, to allow the carpet to be passed under the spike, *d*, which is pulled through the carpet and into the hole, *e*, by the force of the spring, *c*, which always holds it there until lifted up by mechanical means. The top is plated, so that it is ornamental, and when once placed in a house, this fastener will remain without injuring the floor, or becoming useless, for a great length of time.

It was patented April 6, 1858. Further particulars can be obtained by applying to the inventor as above.

The Cloud Engine.

This invention consists, briefly, in the injection of a certain amount of atmospheric air into the steam cylinder, and the admixture thereof with the steam. A saving of 33 per cent in the fuel has been claimed for the improvement. It is the invention of Wm. Mt. Storm, of this city. Sundry experiments, it is said, have at times exhibited the above gain, while others have shown no advantage to arise from the improvement.

P. McManus, of Troy, N. Y., a part owner of the patent, writes us that he has lately put in operation at that place a 7-horse horizontal engine, with the Cloud improvement attached, which works successfully. It is said to have run 4½ days at a consumption of one tun of coal. But when the air was shut off, and steam alone used, the engine only ran 2½ days on the same amount of coal, and performed less work at that. Mr. McManus claims to have discovered a remedy for the irregularities that have attended former experiments. If the data is correctly stated, the above trial exhibits a nominal saving equal to 50 per cent in fuel. This seems too good to be true. We understand that the engine can be seen in operation at the Phœnix Works, 543 River street, Troy. Can't some of the scientific Trojans look into this matter, and report upon it? Where is Professor Wells?

Westlake's Summer Cooking Apparatus.

We illustrated and described this invention on page 161 of the present volume of Scientific American; since which we have had one in use, and find it to be exactly the thing for summer use. A very small quantity of charcoal will cook, boil water, or heat irons in a short time, making no dirt or dust, and there is no suffocating atmosphere such as a range produces in hot weather. We can heartily recommend it. The manufacturers and dealers are Smith & Burns, 9 Carmine street, New York.

We have to thank C. F. Loosey, Esq., Austrian Consul at New York, for six numbers of the *Zeitschrift*, the journal of the Austrian engineers, published in Vienna.

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